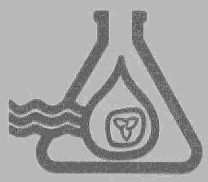

Drinking Water Surveillance Program

LAKE HURON WATER SUPPLY SYSTEM

Annual Report 1987

Environment Ontario

Jim Bradley, Minister

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LAKE HURON
WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE PROGRAM

ANNUAL REPORT 1987

ONTARIO MINISTRY OF ENVIRONMENT
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ACKNOWLEDGEMENTS

The Drinking Water Surveillance Program (DWSP) employs a team approach requiring the co-operative effort of the Ministry of the Environment (MOE) staff from Water Resources and Laboratory Services Branch and the Regions, as well as plant operational staff from the Municipalities.

This annual report was produced by the DWSP Group (Ron Hunsinger, Peter Bohm, Carol Sackville-Duyvelshoff, Chris Fung and John McGrachan) and by Pat Lachmaniuk (on developmental assignment to the Drinking Water Section). Helpful input and reviews were received from Drinking Water Section Staff, in addition to reviews by other MOE and municipal personnel.

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

LAKE HURON WATER SUPPLY SYSTEM 1987 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored.

The Lake Huron Water Supply System is a conventional treatment plant which treats water from Lake Huron. The process consists of coagulation, flocculation, sedimentation, filtration and disinfection. Treated water from this plant is pumped to London where it is fluoridated prior to distribution. This plant serves a population of approximately 275,000 people and has a design capacity of 345.5 x 1000m3/day.

Water samples from the raw, treated, Arva Reservoir and two distribution system sites were taken on a monthly basis. Sampling at distribution system Site 3 was discontinued in March and Site 2 was incorporated onto the program. The Lake Huron Water Supply System was sampled, for approximately 160 parameters, 12 times during 1987. Parameters were divided into the following groups: Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organic (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles). Chlorophenols and Specific Pesticides were analysed for in June and November only.

A summary of results is shown in Table 1.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of the water, however routine bacteriological monitoring as outlined in the Ontario Drinking Water Objectives (ODWOs) is carried out by the operatong agency. In terms of the limited DWSP bacteriological examination the water was of good quality.

Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were below any applicable health related ODWOs.

Of a total of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

Many of the substances analysed for were naturally-occurring or treatment by-products.

During 1987 the DWSP sampling results indicated that the Lake Huron Water Supply System produced good quality water at the plant and this quality was maintained throughout the distribution system.

SOMMAIRE

PROGRAMME DE SURVEILLANCE DE L'EAU POTABLE

RÉSEAU D'ALIMENTATION EN EAU DU LAC HURON
RAPPORT ANNUEL 1987

Le Programme de surveillance de l'eau potable (PSEP) de l'Ontario fournit des informations immédiates, fiables et à jour sur la qualité de l'eau potable. Le PSEP a débuté officiellement en avril 1986. Il est destiné à englober tous les réseaux municipaux d'alimentation en eau de l'Ontario. Actuellement, 44 stations en font partie.

Le réseau du lac Huron est une station classique. Le traitement comporte la coagulation, la floculation, la décantation, la filtration et la désinfection. L'eau traitée est pompée jusqu'à London, où elle est fluorée avant d'être distribuée. La station dessert une population d'environ 275 000 habitants et a une capacité nominale de 345,5 x 1 000 m3/jour.

Des prélèvements d'eau brute et d'eau traitée, du réservoir d'Arva et de deux points du réseau de distribution ont été effectués chaque mois. L'échantillonnage a été discontinué en mars au site n° 3 du réseau de distribution, et le site n° 2 a alors été intégré au programme. Douze fois en 1987, les prélèvements ont été analysés par rapport à environ 160 paramètres dans les catégories suivantes : bactériologique, inorganique et physique (analyses en laboratoire et sur place, présence de métaux) et organique (composés aromatiques chlorés, chlorophénols, pesticides et BPC, dérivés phénoliques, hydrocarbures aromatiques polynucléaires, pesticides particuliers et composés volatils). Les chlorophénols et les pesticides particuliers n'ont été analysés qu'en juin et en novembre.

Le tableau 1 résume les résultats obtenus.

En raison de la fréquence des prélèvements (un par mois), le PSEP ne permet pas d'évaluer tous les aspects de la qualité bactériologique de l'eau. Cependant, comme on le recommande dans le cadre des objectifs relatifs à la qualité de l'eau potable en Ontario, un contrôle bactériologique est effectué par l'exploitant. L'analyse bactériologique limitée du PSEP a révélé une eau de bonne qualité.

Les mesures des paramètres inorganiques et physiques étaient inférieures aux limites applicables fixées par l'Ontario pour la santé.

Pour environ 110 paramètres organiques mesurés chaque mois, aucun résultat n'a dépassé les limites acceptables fixées pour la santé.

Un grand nombre de substances détectées apparaissent naturellement ou sont des produits dérivés de l'épuration.

Les résultats des analyses effectuées en 1987 dans le cadre du PSEP ont indiqué que le réseau d'alimentation en eau du lac Huron donnait une eau de bonne qualité et que cette qualité était maintenue dans tout le réseau de distribution.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE BY SCAN (1987)

	SCAN	RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
		TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
	BACTERIOLOGICAL	30	21	70	38	6	15	42	7	16	31	3	9	14	1	7	8	0	0
	CHEMISTRY (FLD)	30	30	100	60	60	100	60	60	100	54	54	100	51	51	100	20	20	100
	CHEMISTRY (LAB)	207	162	78	207	143	69	214	143	66	167	125	74	191	149	78	64	52	81
	METALS	208	100	48	223	110	49	239	93	38	200	87	43	235	112	47	80	35	43
	CHLOROAROMATICS	143	0	0	143	0	0	156	0	0	91	0	0	78	0	0	26	0	0
	CHLOROPHENOLS	12	0	0	12	0	0	12	0	0	.	.	.	.	.	.	.	.	.
	PAH	34	0	0	17	0	0	51	0	0	.	.	.	.	.	.	.	.	.
	PESTICIDES & PCB	269	0	0	270	0	0	293	0	0	174	0	0	149	0	0	48	0	0
	PHENOLICS	10	1	10	11	0	0	10	0	0	.	.	.	.	.	.	1	0	0
	SPECIFIC PESTICIDES	144	0	0	144	0	0	144	0	0	63	0	0	54	0	0	18	0	0
	VOLATILES	282	1	0	310	45	14	338	49	14	226	33	14	169	25	14	57	8	14
TOTAL		1369	315		1435	364		1559	352		1006	302		941	338		322	115	

NO HEALTH RELATED GUIDELINES/LIMITS WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE

A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

LAKE HURON WATER SUPPLY SYSTEM
1987 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored. Appendix A contains a detailed description of the DWSP.

The DWSP was initiated at the Lake Huron Water Supply System in summer of 1986. An annual report was published in 1986 (ISBN 0-7729-2558-5).

This report contains information and results for 1987.

PLANT DESCRIPTION

The Lake Huron Water Treatment Plant is a conventional treatment plant which treats water from Lake Huron. The process consists of coagulation, flocculation, sedimentation, filtration and disinfection. Treated water from this plant is routed to the Arva Reservoir in London where it is fluoridated prior to distribution. The Lake Huron Water Supply System, serves a

population of approximately 275,000 people. It has a design capacity of 345.5 x 1000m3/day and daily flows ranging from 80 x 1000m3/day to 272 x 1000m3/day.

The plant location is shown in Figure 1. Plant process details, in a block schematic, are shown in Figure 2. General plant information is presented in Table 2.

METHODS

Water samples were obtained from six DWSP approved locations;

i) Plant Raw - The water originated from the lowlift pump prior to chlorination and was sampled through a stainless steel line. The sample tap is located by the lowlift discharge.

ii) Plant Treated (Treated1) - The water originated from the highlift suction header and was sampled through a stainless steel line. The sample tap is located by the highlift suction header.

iii) Arva Reservoir (Treated2) - The water originated from the Arva Reservoir in London and was sampled through a stainless steel line. The location of the sample tap is unavailable.

iv) Distribution System - Site 1 - The distance that this house is from the plant is unavailable. The house is located between the plant and the Arva reservoir. Water was sampled through copper

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

SITE LOCATION MAP

LOCATION: LAKE HURON WATER TREATMENT PLANT

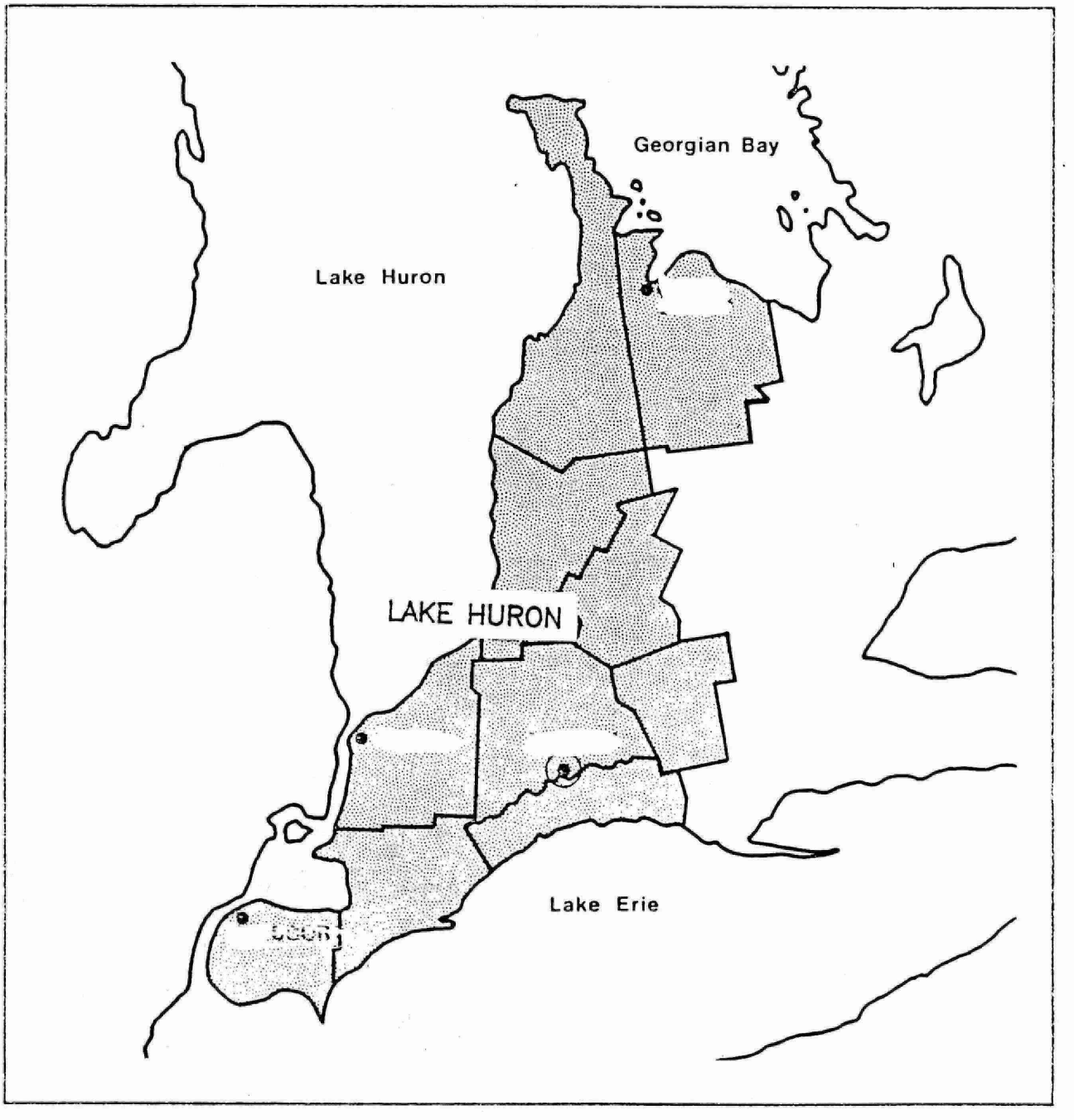


Figure 2

GRAND BEND WATER TREATMENT PLANT

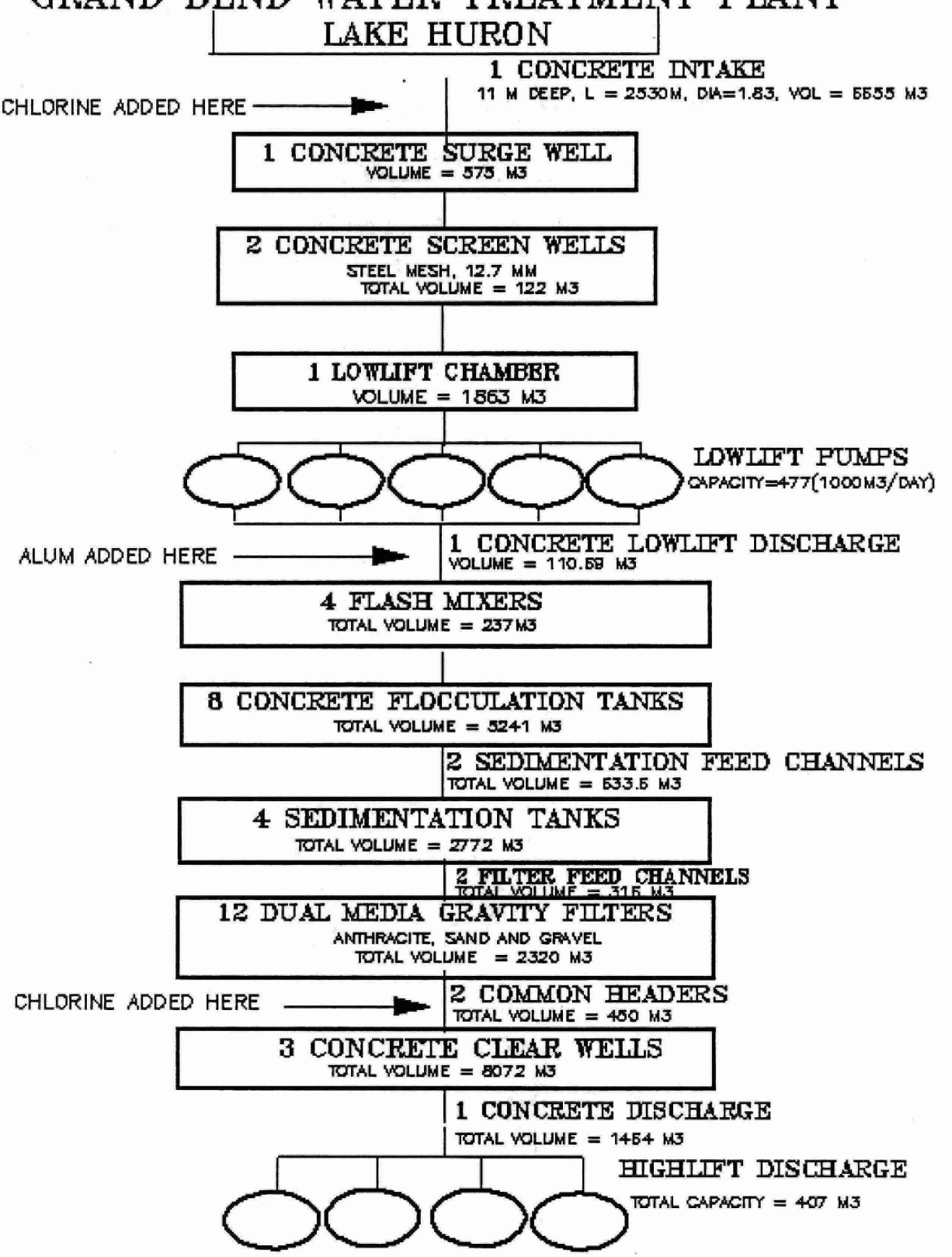


TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

LAKE HURON WATER SUPPLY SYSTEM

LOCATION:	P.O. BOX 40 GRAND BEND, ONTARIO NOM 1TO (519-238-8466)
SOURCE:	RAW WATER SOURCE - LAKE HURON
RATED CAPACITY:	345.5 (1000 M3/DAY)
OPERATION:	MINISTRY OF THE ENVIRONMENT
PLANT SUPERINTENDENT:	W. STURDEVANT
MINISTRY REGION:	SOUTHWESTERN
DISTRICT OFFICER:	R. BROWN

MUNICIPALITY SERVED	POPULATION
CITY OF LONDON	260,000
VILLAGE OF ILDERTON	4,765
VILLAGE OF AILSA CRAIG	831
TOWN OF PARKHILL	1,347
LONDON TOWNSHIP	1,958
MCGILLIVRAY TOWNSHIP	1,820
STEPHEN TOWNSHIP	4,204
WEST WILLIAMS TOWNSHIP	952

plumbing from the basement laundry tap.

v) Distribution System - Site 2 - The distance that this house is from the plant is unavailable. It receives water from the Arva Reservoir. Water was sampled through copper plumbing from the basement laundry tap.

vi) Distribution System - Site 3 - The distance that this house is from the plant is unavailable. It receives water from the Arva Reservoir. Water was sampled through copper plumbing from the basement laundry tap.

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At all distribution system locations two types of samples were obtained: a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples are used to make an assessment of the amount by which the levels of inorganic compounds and metals may be changed on standing, due to leaching from (or deposition on), the plumbing system. The only analysis carried out on these samples therefore, are General Chemistry and Metals. The free flow sample represented fresh water from the distribution main that had been flowing for five minutes before being sampled.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. The retention time was calculated by dividing the volume of water between the two sampling points by the sample day flow. For example, if it was determined that the retention time within the plant was five hours then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to eliminate any variance (Appendix B).

Sample day flow, treatment chemical dosages and field measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered onto the DWSP data base as submitted.

RESULTS

The Lake Huron Water Supply System was sampled for approximately 160 parameters on a monthly basis. Sampling of the distribution system sites was very erratic. Distribution system Site 3 was only sampled in January and February and then was replaced by distribution system Site 2. The Specific Pesticides and Chlorophenols scans were sampled for in June and November only.

Polynuclear Aromatic Hydrocarbons and Phenolics were only analysed for in the raw and treated water at the plant.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed for by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 presents parameters not detected.

Associated guidelines and detection limits are also supplied on both tables. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently initiated by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

As stated under Results, traces do not indicate quantifiable results as defined by established MOE laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. **DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.**

Bacteriology

Positive results for the Bacteriology scan were present six times in the treated water, seven times in the Arva reservoir water, three times in the distribution system Site 1 water and once in

the Site 2 water. The positive parameters were Standard Plate Count, Total Coliform and Total Coliform Background. No ODWOs were exceeded.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of water. Routine bacteriological monitoring as recommended in the ODWOs is carried out by the operating authority. Water from the Lake Huron Water System, in terms of the limited DWSP bacteriological examination, was of good quality.

Inorganic and Physical Parameters

Laboratory and Field Chemistry

The results for the Laboratory Chemistry and Field Chemistry scans were below applicable health related ODWOs.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of Turbidity is its interference with disinfection in the treatment plant and maintenance of a chlorine residual. The ODWO of 1 Formazin Turbidity Unit (FTU) is only applicable to treated water leaving the plant.

The Arva Reservoir October water exceeded the ODWO with a Laboratory Turbidity value of 1.15 FTU. The February sample had a Field Turbidity of 7.4 FTU, since the Laboratory Turbidity

value was 0.1 FTU it is assumed that this was a transcription error and the value was in fact a pH.

There are ODWOs that are set for parameters which are related to aesthetic quality rather than health. One of these is Organic Nitrogen. Organic Nitrogen is calculated by subtracting the Ammonia (Ammonium Total) value from the Total Kjeldahl Nitrogen (Nitrogen Tot Kjeld) value. In a number of distribution system samples the Organic Nitrogen values exceeded the aesthetic ODWO of 0.15 mg/L. When Organic Nitrogen exceeds 0.15 mg/l in treated water some taste and odour problems can result.

This guideline is exceeded in most supplies. Based on the information obtained from the DWSP, which generally indicates no problems with this parameter exceedence, the guideline may be modified when the ODWOs are reviewed.

It is desirable that the Temperature of drinking water be less than 15°C; the palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The desired ODWO was exceeded in several of the treated water and distribution samples.

As part of the treatment process, Fluosilic Acid is added to the treated water at the Arva Reservoir (Table 3). Where fluoridation is practiced, the fluoride concentration recommended in the ODWO is 1.2 mg/L, plus or minus 0.2 mg/L. Maintenance of

this level was not achieved in the distribution system water as indicated by the Fluoride levels which are usually below 1.0 mg/L. Fluoride was not added in January.

Metals

The results reported for the Metals scan were below any applicable health related ODWOs.

Iron levels were generally lower in the treated water as compared to the raw water. This is a result of the treatment process. The addition of Alum as a coagulant to the raw water and the resulting coagulation/settling process has been shown to reduce the levels of most metals.

Copper levels increased in the distribution system Site 2 waters as compared to the treated water indicating that Copper was leached from the distribution system mains as the water travelled to this location.

Elevated levels of Copper, Lead and Zinc were detected in the standing samples as compared to the free flow distribution samples thus, indicating that these metals were leached from the household plumbing as the water stood overnight. In several standing water samples from Site 2 the copper and lead values exceeded the ODWO but the free flow samples were well below the limits.

At present, there is no evidence that Aluminum is physiologically harmful and no health limit has been specified. The ODWO indicates that a useful guideline is to maintain a residual below 0.1 mg/L as Al in the water leaving the plant to avoid post precipitation problems. The measure of residual Aluminum in the treated water is important to indicate the efficiency of the treatment process. Aluminum values exceeded the ODWO operational guideline five times.

Organic Parameters

Chloroaromatics

The results of the Chloroaromatics scan showed that four parameters were detected:

1,2,3 Trichlorobenzene

1,2,4,5-Tetrachlorobenzene

1,3,5 Trichlorobenzene

Hexachloroethane

1,2,3 Trichlorobenzene was detected at trace levels, once in the treated water, the Arva Reservoir and the distribution system Site 2 water and twice in Site 1 water.

1,2,4,5 Tetrachlorobenzene was detected at a trace level, once in the raw water.

1,3,5 Trichlorobenzene was detected at a trace level, once in the Arva Reservoir water.

Hexachloroethane was detected at trace levels, three times in the treated water, twice in the Arva Reservoir water and once at distribution system Site 2.

Review of these results, along with information from other water supplies on DWSP, would indicate that certain Chloroaromatics appear more frequently in the treated water than in the raw and almost always only at trace levels. These occurrences could possibly be due to a reaction of chlorine with organics present in the water or in the distribution system.

Chlorophenols

The results of the Chlorophenols scan showed that no Chlorophenols were detected.

Pesticides and PCB (Polychlorinated Biphenyls)

The results of the Pesticides and PCB scan showed that two pesticides were detected:

Alpha BHC

Lindane

Lindane consists of several isomers of BHC (Benzene Hexachloride). Alpha BHC is the isomer predominantly found in water from the Great Lakes Basin as indicated in results from other water supplies on DWSP.

Alpha BHC was detected at trace levels, seven times in the raw water, nine times in the treated water, nine times in the Arva Reservoir water, five times in the distribution system Site 1, six times in the Site 2 water and twice in the Site 3 water.

Lindane was detected at trace levels, once in the raw water, three times in the treated water and the Arva Reservoir water, once in the distribution system Site 1 water, and twice in the Site 2 and Site 3 waters.

Specific Pesticides

Results of the Specific Pesticides scan showed that one parameter was detected:

Atrazine

Atrazine was detected at trace levels once in the raw, treated, Arva Reservoir and distribution system Site 2 waters.

Phenolics

Phenolics were detected at trace levels, six times in the raw water and three times in the treated water and Arva Reservoir water and once in the distribution system Site 3 water. Phenolic compounds are present in the aquatic enviromnent as a result of natural and/or industrial processes.

Polynuclear Aromatic Hydrocarbons (PAH)

The results of the PAH scan showed that no PAHs were detected.

Volatiles

The results of the Volatiles scan showed that five parameters, other than Trihalomethanes(THMs), were detected:

Benzene

Toluene

Ethylbenzene

Trichloroethylene

Tetrachloroethylene

Benzene was detected at trace levels, twice in the Arva Reservoir water and once in the distribution system Site 2 water.

Toluene was detected at a trace level, once in the distribution system Site 2 water. Positive results were detected in all November samples. These results were considered by the laboratory as unreliable due to contamination as indicated by the remark code 'UCS'.

Ethylbenzene was detected at trace levels, three times in the treated water, three times in the Arva Reservoir water and once in the distribution system Site 1 water.

These volatiles are typically found on an occasional basis at other water supplies included on the DWSP, usually at trace levels.

Trichloroethylene was detected at a trace level, once in the treated water.

Tetrachloroethylene was detected at a trace level, once in the treated water.

THMs are acknowledged to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised mainly of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurrs occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Chlorodibromomethane, Dichlorobromomethane and Total THMs were detected in all treated water samples. Bromoform was detected, at trace levels, four times the treated water and Arva Reservoir water, three times in the distribution system Site 1 water and once in the Site 2 water. All THM occurrences were well below the ODWO of 350 ug/l for Total THMs.

CONCLUSIONS

The Lake Huron Water Supply System for the sample year of 1987 produced good quality water at the plant and this was maintained throughout the distribution system.

No health related guidelines, for organic or inorganic parameters, were exceeded during 1987.

RECOMMENDATIONS

Four recommendations can be made:

1) The data base should be reviewed in consultation with Regional, Plant and DWSP personnel to determine if sampling location, sampling frequency and the number of parameters analysed could be revised to allow for a more efficient characterization of the water.

2) Fluoridation practise should be adjusted to ensure that the recommended fluoride level is maintained in the distributed water.

3) It is important to maintain sampling of distributed water. Increased effort in the sampling of water from distribution system Site 2 is required.

4) The addition of a third distribution site should be considered.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

	SAMPLE DAY CONDITIONS		TREATMENT CHEMICAL DOSAGES (MG/L)				
			PRE-CHLORINATION	POST-CHLORINATION	COAGULATION		FLUORIDATION
			CHLORINE	CHLORINE	ALUM LIQUID	POLY ALUMINUM CHLORIDE	FLUOSILIC ACID
DATE	RETENTION TIME(HRS)	FLOW (1000 M3)					
JAN 19	4.0	150.0	.	1.10	11.00	.	.
FEB 16	4.1	146.5	.	.75	20.00	.	.92
MAR 16	4.2	143.4	.	.85	22.80	.	.93
APR 21	3.9	154.5	.52	1.00	.	15.90	1.00
MAY 19	4.0	150.0	.	1.50	13.50	.	1.00
JUN 15	2.9	204.8	.	1.30	16.70	.	1.00
JUL 20	.	.	.	.	.	.	.96
AUG 17	2.6	228.0	.	1.17	25.70	.	.99
SEP 21	3.3	181.8	1.00	1.20	17.00	.	.99
OCT 19	3.9	154.5	1.00	1.05	14.70	.	1.00
NOV 16	.	.	2.00	.96	12.00	.	1.00
DEC 17	.	141.4	.	1.40	16.00	.	1.10

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

		RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL	FECAL COLIFORM MF	8	1	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	P/A BOTTLE	.	.	.	10	0	0	11	0	0	8	0	0	4	0	0	2	0	0
	STANDRD PLATE CNT MF	6	6	0	8	6	0	9	4	0	7	2	0	2	1	0	2	0	0
	T COLIFORM BCKGRD MF	8	8	0	10	0	0	11	2	0	8	1	0	4	0	0	2	0	0
	TOTAL COLIFORM MF	8	6	0	10	0	0	11	1	0	8	0	0	4	0	0	2	0	0
*TOTAL SCAN BACTERIOLOGICAL		30	21	0	38	6	0	42	7	0	31	3	0	14	1	0	8	0	0
*TOTAL GROUP BACTERIOLOGICAL		30	21	0	38	6	0	42	7	0	31	3	0	14	1	0	8	0	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	10	10	0	11	11	0	9	9	0	4	4	0	4	4	0
	FLD CHLORINE FREE	.	.	.	10	10	0	11	11	0	9	9	0	12	12	0	4	4	0
	FLD PH	10	10	0	10	10	0	10	10	0	9	9	0	12	12	0	4	4	0
	FLD TURBIDITY	10	10	0	10	10	0	5	5	0	9	9	0	.	.	.	.	.	.
	TEMPERATURE	10	10	0	10	10	0	12	12	0	9	9	0	11	11	0	4	4	0
	TOTAL CHLORINE	.	.	.	10	10	0	11	11	0	9	9	0	12	12	0	4	4	0
*TOTAL SCAN CHEMISTRY (FLD)		30	30	0	60	60	0	60	60	0	54	54	0	51	51	0	20	20	0
CHEMISTRY (LAB)	ALKALINITY	11	11	0	11	11	0	11	11	0	10	10	0	12	12	0	4	4	0
	AMMONIUM TOTAL	11	8	3	11	3	6	12	1	5	10	2	5	10	2	6	4	0	2
	CALCIUM	11	11	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	CHLORIDE	11	11	0	11	11	0	11	11	0	10	10	0	12	12	0	4	4	0
	COLOUR	11	0	10	11	0	7	11	0	5	10	0	5	12	0	4	4	0	4

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED1 TOTAL	TREATED1 POSITIVE	TREATED1 TRACE	TREATED2 TOTAL	TREATED2 POSITIVE	TREATED2 TRACE	SITE1 TOTAL	SITE1 POSITIVE	SITE1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE	SITE 3 TOTAL	SITE 3 POSITIVE	SITE 3 TRACE
CHEMISTRY (LAB)	CONDUCTIVITY	11	11	0	11	11	0	11	11	0	10	10	0	12	12	0	4	4	0
	CYANIDE	9	0	0	9	0	0	9	0	0	7	0	0	5	0	0	.	.	.
	FLUORIDE	11	10	1	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	HARDNESS	11	11	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	MAGNESIUM	11	11	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	NITRITE	11	4	7	11	0	9	12	0	5	10	1	6	10	2	5	4	0	2
	NITROGEN TOT KJELD	11	11	0	11	7	4	11	2	8	10	4	6	12	5	7	4	4	0
	PH	11	11	0	11	11	0	11	11	0	10	10	0	12	12	0	4	4	0
	PHOSPHORUS FIL REACT	11	4	5	11	0	7	10	4	6	.	.	.	.	.	.	.	.	.
	PHOSPHORUS TTL-UNFIL	11	4	6	11	1	3	10	0	7	.	.	.	.	.	.	.	.	.
	RESIDUE (TOTAL)	11	11	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	SODIUM	11	11	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	TOTAL NITRATES	11	11	0	11	11	0	12	12	0	10	10	0	10	10	0	4	4	0
	TURBIDITY	11	11	0	11	11	0	11	8	3	10	8	2	12	10	2	4	4	0
*TOTAL SCAN CHEMISTRY (LAB)		207	162	32	207	143	36	214	143	39	167	125	24	191	149	24	64	52	8
METALS	ALUMINUM	10	9	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	ARSENIC	11	0	0	11	0	0	11	0	0	10	0	0	12	0	0	4	0	0
	BARIUM	10	10	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	BERYLLIUM	10	0	0	11	0	0	12	0	0	10	0	0	12	0	0	4	0	0
	BORON	11	4	5	11	3	6	11	3	5	10	4	5	12	2	6	4	3	0
	CADMIUM	10	1	0	11	0	0	12	0	0	10	0	0	12	0	0	4	0	0
	CHROMIUM	10	1	0	11	4	0	12	4	0	10	3	0	12	6	0	4	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	COBALT	10	1	0	11	1	0	12	0	0	10	1	0	12	0	0	4	0	0
	COPPER	10	8	0	11	11	0	12	8	0	10	10	0	12	12	0	4	4	0
	CYANIDE	3	0	0	3	0	0	3	0	0	2	0	0	1	0	0	2	0	0
	IRON	10	9	0	11	8	0	12	8	0	10	7	0	12	9	0	4	4	0
	LEAD	10	2	0	11	1	0	12	2	0	10	3	0	12	9	0	4	2	0
	MANGANESE	10	10	0	11	8	0	12	6	0	10	2	0	12	11	0	4	2	0
	MERCURY	11	9	0	11	10	0	12	4	0	8	3	0	6	3	0	2	1	0
	MOLYBDENUM	10	1	0	11	2	0	12	2	0	10	2	0	12	0	0	4	2	0
	NICKEL	10	2	0	11	8	0	12	2	0	10	3	0	12	1	0	4	0	0
	SELENIUM	11	0	0	11	0	0	11	0	0	10	0	0	12	0	0	4	0	0
	STRONTIUM	10	10	0	11	11	0	12	12	0	10	10	0	12	12	0	4	4	0
	URANIUM	11	10	1	11	10	1	11	10	1	10	8	0	12	11	0	4	1	0
	VANADIUM	10	3	0	11	0	0	12	0	0	10	1	0	12	0	0	4	0	0
	ZINC	10	10	0	11	11	0	12	8	0	10	10	0	12	12	0	4	4	0
*TOTAL SCAN METALS .		208	100	6	223	110	7	239	93	6	200	87	5	235	112	6	80	35	0
*TOTAL GROUP INORGANIC & PHYSICAL		445	292	38	490	313	43	513	296	45	421	266	29	477	312	30	164	107	8
CHLOROAROMATICS	123 TRICHLOROBENZENE	11	0	0	11	0	1	12	0	1	7	0	2	6	0	1	2	0	0
	1234 T-CHLOROBENZENE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	1235 T-CHLOROBENZENE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	124 TRICHLOROBENZENE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	1245 T-CHLOROBENZENE	11	0	1	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	135 TRICHLOROBENZENE	11	0	0	11	0	0	12	0	1	7	0	0	6	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

		SITE	RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
SCAN	PARAMETER		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROAROMATICS	236 TRICHLOROTOLUENE		11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	245 TRICHLOROTOLUENE		11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	26A TRICHLOROTOLUENE		11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	HEXACHLOROBUTADIENE		11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	HEXACHLOROETHANE		11	0	0	11	0	3	12	0	2	7	0	0	6	0	1	2	0	0
	OCTACHLOROSTYRENE		11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	PENTACHLOROBENZENE		11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
*TOTAL SCAN CHLOROAROMATICS			143	0	1	143	0	4	156	0	4	91	0	2	78	0	2	26	0	0
CHLOROPHENOLS	234 TRICHLOROPHENOL		2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	2345 T-CHLOROPHENOL		2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	2356 T-CHLOROPHENOL		2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	245-TRICHLOROPHENOL		2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	246-TRICHLOROPHENOL		2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	PENTACHLOROPHENOL		2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
*TOTAL SCAN CHLOROPHENOLS			12	0	0	12	0	0	12	0	0	0	0	0	0	0	0	0	0	0
PAH	ANTHANTHRENE		0	0	0	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	ANTHRACENE		2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	BENZO(A)ANTHRACENE		2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	BENZO (A) PYRENE		2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED1 TOTAL	TREATED1 POSITIVE	TREATED1 TRACE	TREATED2 TOTAL	TREATED2 POSITIVE	TREATED2 TRACE	SITE1 TOTAL	SITE1 POSITIVE	SITE1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE	SITE 3 TOTAL	SITE 3 POSITIVE	SITE 3 TRACE
PAH	BENZO(B) CHRYSENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	BENZO(B) FLUORANTHEN	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	BENZO(E)PYRENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	BENZO(G,H,I) PERYLEN	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	BENZO(J) FLUORANTHEN	0	0	0	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	BENZO(K) FLUORANTHEN	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	CHRYSENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	CORONENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	DIBENZO(A,H) ANTHRAC	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	DIMETH. BENZ(A)ANTHR	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	FLUORANTHENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	INDENO(1,2,3-C,D) PY	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	PERYLENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	PHENANTHRENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
	PYRENE	2	0	0	1	0	0	3	0	0	.	.	.	.	.	.	.	.	.
*TOTAL SCAN PAH		34	0	0	17	0	0	51	0	0	0	0	0	0	0	0	0	0	0
PESTICIDES & PCB	ALACHLOR	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	ALDRIN	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	ALPHA BHC	11	0	7	11	0	9	12	0	9	7	0	5	6	0	6	2	0	2
	ALPHA CHLORDANE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	ATRATONE	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	BETA BHC	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED1 TOTAL	TREATED1 POSITIVE	TREATED1 TRACE	TREATED2 TOTAL	TREATED2 POSITIVE	TREATED2 TRACE	SITE1 TOTAL	SITE1 POSITIVE	SITE1 TRACE	SITE 2 TOTAL	SITE 2 POSITIVE	SITE 2 TRACE	SITE 3 TOTAL	SITE 3 POSITIVE	SITE 3 TRACE
PESTICIDES & PCB	DIELDRIN	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	ENDRIN	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	ETHYLENE DIBROMIDE	7	0	0	8	0	0	9	0	0	6	0	0	5	0	0	.	.	.
	GAMMA CHLORDANE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	HCB	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	HEPTACHLOR	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	HEPTACHLOR EPOXIDE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	LINDANE	11	0	1	11	0	3	12	0	3	7	0	1	6	0	2	2	0	2
	METHOXYCHLOR	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	MIREX	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	OPDDT	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	OXYCHLORDANE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	PCB	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	PP-DDD	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	PPDDE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	PPDDT	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	THIODAN I	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	THIODAN II	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
	THIODAN SULPHATE	11	0	0	11	0	0	12	0	0	7	0	0	6	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB		269	0	8	270	0	12	293	0	12	174	0	6	149	0	8	48	0	4
PHENOLICS	PHENOL	10	1	6	11	0	3	10	0	3	.	.	.	.	.	.	1	0	1
*TOTAL SCAN PHENOLICS		10	1	6	11	0	3	10	0	3	0	0	0	0	0	0	1	0	1

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	2,4,5-T	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	2,4-D	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	2,4-DP	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	24DCHLRPHENOXYBUTYRC	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	AMETRYNE	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	AMINOCARB	0	0	0	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	ATRAZINE	10	0	1	10	0	1	10	0	1	7	0	0	6	0	1	2	0	0
	BENOMYL	0	0	0	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	BLADEX	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	BUX	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	CARBOFURAN	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	CIPC	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	DIALLATE	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	DIAZINON	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	DICAMBA	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	DICHLOROVOS	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	DURSBAN	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	EPTAM	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	ETHION	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	GUTHION	0	0	0	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	IPC	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	MALATHION	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	METHYL PARATHION	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	METHYLTRITHION	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	METOLACHLOR	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

		SITE																	
		RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	MEVINPHOS	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	PARATHION	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	PHORATE	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	PICHLORAM	0	0	0	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	PROMETONE	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	PROMETRYNE	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	PROPAZINE	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	PROPOXUR	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	RELDAN	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	RONNEL	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	SENCOR	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	SEVIN	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	SILVEX	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	SIMAZINE	10	0	0	10	0	0	10	0	0	7	0	0	6	0	0	2	0	0
	SUTAN	2	0	0	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.
	TOXAPHENE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*TOTAL SCAN SPECIFIC PESTICIDES		144	0	1	144	0	1	144	0	1	63	0	0	54	0	1	18	0	0
VOLATILES	1,1 DICHLOROETHANE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	1,1 DICHLOROETHYLENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	1,2 DICHLOROBENZENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	1,2 DICHLOROETHANE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	1,2 DICHLOROPROPANE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

		SITE	RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
SCAN	PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
VOLATILES	1,3 DICHLOROBENZENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	1,4 DICHLOROBENZENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	111, TRICHLOROETHANE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	112 TRICHLOROETHANE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	1122 T-CHLOROETHANE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	BENZENE	10	0	0	11	0	0	12	0	2	8	0	0	6	0	1	2	0	0
	BROMOFORM	10	0	0	11	0	4	12	0	4	8	0	3	6	0	1	2	0	0
	CARBON TETRACHLORIDE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	CHLOROBENZENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	CHLORODIBROMOMETHANE	10	0	0	11	11	0	12	12	0	8	8	0	6	6	0	2	2	0
	CHLOROFORM	10	0	0	11	11	0	12	12	0	8	8	0	6	6	0	2	2	0
	DICHLOROBROMOMETHANE	10	0	0	11	11	0	12	12	0	8	8	0	6	6	0	2	2	0
	DICHLOROMETHANE	9	0	0	10	0	0	11	0	0	8	0	0	6	0	0	1	0	0
	ETHYLBENZENE	10	0	0	11	0	3	12	0	3	8	0	1	6	0	0	2	0	0
	ETHYLENE DIBROMIDE	3	0	0	3	0	0	3	0	0	2	0	0	1	0	0	2	0	0
	M-XYLENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	O-XYLENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	P-XYLENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	T-CHLOROETHYLENE	10	0	0	11	0	1	12	0	0	8	0	0	6	0	0	2	0	0
	T1,2DICHLOROETHYLENE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
	TOLUENE	10	1	0	11	1	0	12	1	0	8	1	0	6	1	1	2	0	0
	TOTL TRIHALOMETHANES	10	0	0	11	11	0	12	12	0	8	8	0	6	6	0	2	2	0
	TRICHLOROETHYLENE	10	0	0	11	0	1	12	0	0	8	0	0	6	0	0	2	0	0
	TRIFLUOROCHLOROTOLUE	10	0	0	11	0	0	12	0	0	8	0	0	6	0	0	2	0	0
*TOTAL SCAN VOLATILES		282	1	0	310	45	9	338	49	9	226	33	4	169	25	3	57	8	0
*TOTAL GROUP ORGANIC		894	2	16	907	45	29	1004	49	29	554	33	12	450	25	14	150	8	5

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE	RAW			TREATED1			TREATED2			SITE1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
TOTAL		1369	315	54	1435	364	72	1559	352	74	1006	302	41	941	338	44	322	115	13

KEY TO TABLES 5 AND 6

A ONTARIO DRINKING WATER OBJECTIVES
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
1*. MAC for Bacteriological Analyses
Poor water quality is indicated when :
- total coliform counts > 0 < 5
- P/A Bottle Test is present after 48 hours
- Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
- Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
- Standard Plate Count should not exceed 500 organisms per ml at 35 deg C within 48 hours

2. Interim Maximum Acceptable Concentration (IMAC)
3. Maximum Desirable Concentration (MDC)
4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.

B HEALTH & WELFARE CANADA
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC

C WORLD HEALTH ORGANIZATION
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

H USSR MAXIMUM PERMISSIBLE CONCENTRATION

I NEW YORK STATE AMBIENT WATER GUIDELINE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample

RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
	RAW	TREATED1	TREATED2	SITE1		SITE 2		SITE 3	
			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
BACTERIOLOGICAL									
FECAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = 0 (A1)				
JAN	0	.	.	.	.	.	.	.	.
FEB	0	.	.	.	.	.	.	.	.
MAR	0	.	.	.	.	.	.	.	.
MAY	0	.	.	.	.	.	.	.	.
JUN	0	.	.	.	.	.	.	.	.
JUL	0	.	.	.	.	.	.	.	.
OCT	5	.	.	.	.	.	.	.	.
NOV	0	.	.	.	.	.	.	.	.
STANDRD PLATE CNT MF (CT/ML)			DET'N LIMIT = 0		GUIDELINE = 500/ML (A1)				
JAN	36	2	0	.	.	.	.	.	0
FEB	360	3	1	.	0	.	.	.	0
MAR	2400 >	11	0	.	0	.	0	.	.
MAY	!AW	!AW	!AW	.	!AW	.	.	.	.
JUN	250	0	0	.	0	.	!AW	.	.
JUL	!OP	9	2	.	8	.	.	.	.
AUG	.	!AW	!AW	.	.	.	1	.	.
SEP	.	27	1	.	1	.	.	.	.
OCT	240	0	0	.	0	.	.	.	.
NOV	210	5	0	.	0	.	.	.	.
DEC	.	.	1	.	.	.	!AW	.	.
P/A BOTTLE (0=ABSENT)			DET'N LIMIT = 0		GUIDELINE = 0 (A1*)				
JAN	.	0	0	.	.	.	.	.	0

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2						
			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
FEB	.	0	0	.	0	.	.	.	0
MAR	.	0	0	.	0	.	0	.	.
MAY	.	0	0	.	0	.	.	.	.
JUN	.	0	0	.	0	.	0	.	.
JUL	.	0	0	.	0	.	.	.	.
AUG	.	0	0	.	.	.	0	.	.
SEP	.	0	0	.	0	.	.	.	.
OCT	.	0	0	.	0	.	.	.	.
NOV	.	0	0	.	0	.	.	.	.
DEC	.	.	0	.	.	.	0	.	.
TOTAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = 5/100ML(A1)				
JAN	0	0	0	.	.	.	.	.	0
FEB	2 A3C	0	0	.	0	.	.	.	0
MAR	390 A3C	0	0	.	0	.	0	.	.
MAY	2	0	0	.	0	.	.	.	.
JUN	14 A3C	0	2	.	0	.	0	.	.
JUL	0	0	0	.	0	.	.	.	.
AUG	.	0	0	.	.	.	0	.	.
SEP	.	0	0	.	0	.	.	.	.
OCT	12 A3C	0	0	.	0	.	.	.	.
NOV	9	0	0	.	0	.	.	.	.
DEC	.	.	0	.	.	.	0	.	.
T COLIFORM BCKGRD MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = N/A				
JAN	115	0	0	.	.	.	.	.	0

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2						
			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
FEB	396	0	0	.	0	.	.	.	0
MAR	2400 >	0	0	.	0	.	0	.	.
MAY	80	0	1	.	0	.	.	.	.
JUN	3100	0	1	.	0	.	0	.	.
JUL	52000	0	0	.	1	.	.	.	.
AUG	.	0	0	.	.	.	0	.	.
SEP	.	0	0	.	0	.	.	.	.
OCT	2200	0	0	.	0	.	.	.	.
NOV	170	0	0	.	0	.	.	.	.
DEC	.	.	0	.	.	.	0	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2						
			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
CHEMISTRY (FLD)									
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = N/A		GUIDELINE =	N/A			
JAN	.	.100	.350	.	.	.	.	.200	.200
FEB	.	.020	.400	.100	.200	.	.	.200	.200
MAR	.	.100	.300	.200	.200	.	.200	.	.
APR	.	.100	.100	.	.	.	.	.	.
MAY	.	.300	.100	.	.700	.	.100	.	.
JUN	.	.200	.100	.	.200	.	.	.	.
JUL	.	.	.300	.	.	.	.	.	.
AUG	.	.010	.	.	.	.	.100	.	.
SEP	.	.100	.100	.	.100	.	.	.	.
OCT	.	.200	.300	.	.100	.	.	.	.
NOV	.	.100	.300	.	.100	.	.	.	.
DEC	.	.	.300	.	.	.	2.000	.	.
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = N/A		GUIDELINE =	N/A			
JAN	.	.800	.650	.	.	.	.	.300	.500
FEB	.	1.030	.700	.700	.800	.	.	.100	.300
MAR	.	.700	.600	.700	.800	.100	.300	.	.
APR	.	.800	.900	.	.	.	.	.	.
MAY	.	.900	1.000	.	1.700	.100	.300	.	.
JUN	.	1.400	.900	.	.900	.100	.700	.	.
JUL	.	.	.600	.	.	.	.	.	.
AUG	.	1.010	.	.	.	.100	.300	.	.
SEP	.	1.100	.900	.	.900	.	.	.	.
OCT	.	.900	1.000	.	.800	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
NOV	.	1.000	1.000	.	.800	.300	.550	.	.
DEC	.	.	1.000	.	.	.300	.700	.	.
TOTAL CHLORINE (MG/L)			DET'N LIMIT = N/A		GUIDELINE = N/A				
JAN	.	.900	1.000	.	.	.	.	.500	.700
FEB	.	1.050	1.100	.800	1.000	.	.	.300	.500
MAR	.	.800	.900	.900	1.000	.100	.500	.	.
APR	.	.900	1.000	.	.	.	.	.	.
MAY	.	1.220	1.100	.	2.400	.100	.400	.	.
JUN	.	1.600	1.000	.	1.100	.100	.700	.	.
JUL	.	.	.900	.	.	.	.	.	.
AUG	.	1.020	.	.	.	.100	.400	.	.
SEP	.	1.200	1.000	.	1.000	.	.	.	.
OCT	.	1.100	1.300	.	.900	.	.	.	.
NOV	.	1.100	1.300	.	.900	.300	.550	.	.
DEC	.	.	1.300	.	.	.300	.900	.	.
FLD PH (DMSNLESS)			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)				
JAN	7.700	7.500	7.500	.	.	.	.	7.500	7.400
FEB	7.050	7.050	.	7.400	7.400	.	.	7.400	7.200
MAR	7.000	7.400	7.300	7.400	7.400	7.400	7.500	.	.
APR	8.420	8.000	7.800	.	.	.	.	.	.
MAY	7.050	7.050	7.900	.	7.050	7.500	7.400	.	.
JUN	7.700	7.500	7.600	.	7.500	7.500	7.400	.	.
JUL	.	.	7.400	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	7.090	7.050	.	.	.	7.400	7.400	.	.
SEP	8.150	7.600	7.400	.	7.500	.	.	.	.
OCT	7.200	7.600	7.570	.	7.600	.	.	.	.
NOV	7.800	7.500	7.300	.	7.400	7.400	7.400	.	.
DEC	.	.	7.200	.	.	7.400	7.400	.	.
TEMPERATURE (DEG.C)			DET'N LIMIT = N/A		GUIDELINE = N/A				
JAN	5.000	4.000	3.000	.	.	.	.	10.500	7.000
FEB	2.000	5.000	2.000	5.000	5.000	.	.	4.000	5.000
MAR	3.000	4.000	2.500	9.000	4.000	17.000	5.000	.	.
APR	8.000	9.000	7.000	.	.	.	.	.	.
MAY	12.000	14.000	12.000	.	11.000	19.500	11.500	.	.
JUN	12.000	18.000	17.000	.	16.000	20.000	15.000	.	.
JUL	.	.	22.000	.	.	.	.	.	.
AUG	22.000	22.500	22.200	.	.	22.000	20.000	.	.
SEP	19.000	19.500	18.000	.	22.500	.	.	.	.
OCT	13.900	14.000	13.000	.	15.000	.	.	.	.
NOV	.900	.900	9.000	.	.900	19.000	13.000	.	.
DEC	.	.	4.100	.	.	.	12.000	.	.
FLD TURBIDITY (FTU)			DET'N LIMIT = N/A		GUIDELINE = 1.0 (A1)				
JAN	10.600	.180	.	.	.	.	.	.	.
FEB	16.080	.180	7.400	.200	.210	.	.	.	.
MAR	21.000	.090	.	.340	.320	.	.	.	.
APR	1.800	.120	.	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	2.040	.140	.120	.	.190	.	.	.	.
JUN	1.400	.110	.110	.	.140	.	.	.	.
AUG	1.060	.160	.	.	.	.	.	.	.
SEP	2.000	.130	.	.	.130	.	.	.	.
OCT	2.400	.120	.	.	.120	.	.	.	.
NOV	2.200	.240	.180	.	.240	.	.	.	.
DEC	.	.	.140	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE	RAW	TREATED1	TREATED2	SITE1		SITE 2		SITE 3	
TYPE			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
CHEMISTRY (LAB)									
ALKALINITY (MG/L)			DET'N LIMIT = .200		GUIDELINE = 30-500 (A4)				
JAN	86.500	82.200	81.700	.	.	.	.	80.100	77.800
FEB	93.900	87.900	86.000	84.300	84.400	.	.	82.200	81.700
MAR	95.400	89.200	!LA	83.300	82.100	88.500	87.400	.	.
APR	80.600	76.800	76.900	.	.	.	.	.	.
MAY	83.900	78.900	75.700	.	78.500	80.100	79.900	.	.
JUN	87.300	75.600	73.700	.	78.700	75.600	74.000	.	.
JUL	85.100	75.200	75.800	!RE	78.500	.	.	.	.
AUG	82.400	75.500	71.900	.	.	74.300	73.500	.	.
SEP	84.800	79.800	77.000	.	79.000	.	.	.	.
OCT	83.500	79.000	77.400	.	78.900	.	.	.	.
NOV	83.800	78.500	76.000	.	79.000	78.800	76.300	.	.
DEC	!NR	!NR	74.900	!NR	!NR	78.100	80.000	.	.
CALCIUM (MG/L)			DET'N LIMIT = .100		GUIDELINE = 100. (F2)				
JAN	29.500	29.700	29.800	.	.	.	.	29.700	28.800
FEB	33.300	33.600	32.500	31.200	31.900	.	.	31.200	30.900
MAR	32.700	33.300	33.300	31.100	30.700	33.200	33.300	.	.
APR	27.300	26.800	27.400	.	.	.	.	.	.
MAY	28.400	28.800	29.400	.	29.000	31.000	31.600	.	.
JUN	28.400	28.000	28.200	.	28.600	30.400	31.000	.	.
JUL	28.800	29.800	29.600	!RE	29.800	.	.	.	.
AUG	29.000	28.800	28.100	.	.	29.800	29.500	.	.
SEP	29.400	30.000	29.800	.	29.600	.	.	.	.
OCT	28.200	28.200	28.000	.	28.200	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
NOV	29.800	27.400	28.600	.	27.800	30.600	30.800	.	.
DEC	!NR	!NR	28.600	!NR	!NR	28.600	28.600	.	.
CHLORIDE (MG/L)			DET'N LIMIT = .200		GUIDELINE = 250.0 (A3)				
JAN	6.000	6.500	7.000	.	.	.	.	7.000	7.500
FEB	7.000	7.500	8.000	7.500	7.500	.	.	7.500	7.500
MAR	7.000	7.500	!SM	7.500	7.500	8.000	8.000	.	.
APR	5.500	6.500	7.000	.	.	.	.	.	.
MAY	5.500	7.000	7.000	.	7.500	7.500	7.500	.	.
JUN	5.500	7.000	7.000	.	7.000	7.000	7.000	.	.
JUL	6.000	7.000	7.000	!RE	7.000	.	.	.	.
AUG	6.000 RRV	7.500	7.500	.	.	8.000	8.000	.	.
SEP	6.000	7.500	7.500	.	7.500	.	.	.	.
OCT	6.000	7.100	7.600	.	7.100	.	.	.	.
NOV	5.700	6.600	7.100	.	6.700	6.900	6.900	.	.
DEC	!NR	!NR	7.100	!NR	!NR	7.200	7.100	.	.
COLOUR (TCU)			DET'N LIMIT = .5		GUIDELINE = 5.0 (A3)				
JAN	1.000 <T	1.000 <T	1.000 <T	.	.	.	.	2.000 <T	1.000 <T
FEB	2.500 <T	1.000 <T	.500 <T	1.000 <T	.500 <T	.	.	2.000 <T	.500 <T
MAR	1.500 <T	1.000 <T	1.000 <T	1.000 <T	1.000 <T	1.000 <T	1.000 <T	.	.
APR	2.000 <T	1.000 <T	!LA	.	.	.	.	.	.
MAY	BDL	1.000 <T	1.000 <T	.	1.000 <T	1.000 <T	BDL	.	.
JUN	1.000 <T	BDL	BDL	.	BDL	BDL	BDL	.	.
JUL	.500 <T	BDL	BDL	!RE	BDL	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	1.000 <T	.500 <T	BDL	.	.	BDL	BDL	.	.
SEP	1.000 <T	BDL	.500 <T	.	BDL	.	.	.	.
OCT	.500 <T	BDL	BDL	.	BDL	.	.	.	.
NOV	1.000 <T	.500 <T	BDL	.	BDL	BDL	.500 <T	.	.
DEC	INR	INR	BDL	INR	INR	BDL	BDL	.	.
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1		GUIDELINE = 400. (F2)				
JAN	221	226	225	.	.	.	.	221	221
FEB	242	249	251	238	239	.	.	235	233
MAR	246	253	ISM	241	237	254	255	.	.
APR	208	211	219	.	.	.	.	.	.
MAY	219	224	226	.	228	233	237	.	.
JUN	216	223	222	.	219	226	225	.	.
JUL	218	225	224	IRE	226	.	.	.	.
AUG	213	219	217	.	.	224	224	.	.
SEP	216	223	223	.	222	.	.	.	.
OCT	212	216	218	.	217	.	.	.	.
NOV	214	217	217	.	217	220	220	.	.
DEC	INR	INR	222	INR	INR	223	222	.	.
FLUORIDE (MG/L)			DET'N LIMIT = .01		GUIDELINE = 2.400 (A1)				
JAN	.090	.080 RRV	.140	.	.	.	.	.890	.920
FEB	.120	.080	1.040	.070	.070	.	.	.830	.840
MAR	.100	.100	1.080	.090	.090	.850	.880	.	.
APR	.180	.110	1.000	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	.090	.070	1.040	.	.070	.940	.940	.	.
JUN	.100	.060	1.030	.	.080	.970	.940	.	.
JUL	.100	.070	1.200	!RE	.080	.	.	.	.
AUG	.070	.060	1.140	.	.	.980	1.000	.	.
SEP	.040 <T	.060	1.240	.	.080	.	.	.	.
OCT	.100	.080	1.040	.	.080	.	.	.	.
NOV	.080	.060	1.140	.	.060	.980	1.000	.	.
DEC	!NR	!NR	1.180	!NR	!NR	1.020	1.040	.	.
HARDNESS (MG/L)			DET'N LIMIT = .500		GUIDELINE = 80-100 (A4)				
JAN	103.500	103.500	103.500	.	.	.	.	101.500	99.500
FEB	119.000	119.000	116.500	112.000	113.500	.	.	111.000	109.500
MAR	116.000	116.500	116.500	109.000	108.000	116.500	116.000	.	.
APR	99.000	97.500	100.500	.	.	.	.	.	.
MAY	101.000	102.000	103.000	.	103.000	110.000	113.000	.	.
JUN	101.000	101.000	101.000	.	102.000	105.000	108.000	.	.
JUL	103.000	106.000	105.000	!RE	105.000	.	.	.	.
AUG	103.000	103.000	101.000	.	.	105.000	104.000	.	.
SEP	105.000	106.000	106.000	.	106.000	.	.	.	.
OCT	102.000	102.000	101.000	.	102.000	.	.	.	.
NOV	106.000	99.000	102.000	.	100.000	108.000	109.000	.	.
DEC	!NR	!NR	103.000	!NR	!NR	102.000	102.000	.	.
MAGNESIUM (MG/L)			DET'N LIMIT = .050		GUIDELINE = 30. (F2)				
JAN	7.300	7.100	7.000	.	.	.	.	6.600	6.700

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
FEB	8.750	8.550	8.600	8.250	8.200	.	.	8.050	7.800
MAR	8.300	8.000	8.100	7.600	7.600	8.100	8.000	.	.
APR	7.400	7.400	7.800	.	.	.	.	.	.
MAY	7.300	7.200	7.300	.	7.300	8.100	8.200	.	.
JUN	7.400	7.400	7.400	.	7.500	7.100	7.400	.	.
JUL	7.500	7.500	7.500	!RE	7.500	.	.	.	.
AUG	7.600	7.600	7.500	.	.	7.500	7.500	.	.
SEP	7.700	7.700	7.700	.	7.700	.	.	.	.
OCT	7.700	7.800	7.600	.	7.600	.	.	.	.
NOV	7.600	7.500	7.500	.	7.500	7.700	7.800	.	.
DEC	!NR	!NR	7.700	!NR	!NR	7.400	7.500	.	.
SODIUM (MG/L)			DET'N LIMIT = .200		GUIDELINE = 200. (C3)				
JAN	3.000	3.000	3.300	.	.	.	.	3.400	2.800
FEB	3.900	4.400	4.100	3.900	3.900	.	.	3.700	3.700
MAR	3.600	3.600	3.700	3.200	3.100	4.400	3.800	.	.
APR	3.500	3.200	3.400	.	.	.	.	.	.
MAY	3.600	3.600	3.400	.	3.600	3.800	4.000	.	.
JUN	3.600	3.800	3.600	.	3.400	3.200	3.600	.	.
JUL	3.600	3.800	3.800	!RE	4.000	.	.	.	.
AUG	3.400	3.400	3.400	.	.	3.700	3.500	.	.
SEP	4.600	4.800	4.600	.	4.600	.	.	.	.
OCT	4.600	4.400	4.400	.	4.400	.	.	.	.
NOV	3.400	3.400	3.400	.	3.600	3.600	3.400	.	.
DEC	!NR	!NR	3.800	!NR	!NR	3.600	3.600	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002		GUIDELINE = .05 (F2)				
JAN	.002 <T	BDL	BDL	.	.	.	.	BDL	BDL
FEB	.018	.010	.006 <T	.010	.006 <T	.	.	.006 <T	.006 <T
MAR	.020	.010	.008 <T	.014	.008 <T	.014	.020	.	.
APR	.006 <T	.004 <T	.002 <T	.	.	.	.	.	.
MAY	.014	.002	BDL	.	BDL	ISD	ISD	.	.
JUN	.016	.004 <T	.004 <T	.	.006 <T	.008 <T	.006 <T	.	.
JUL	.014	.008 <T	.010	IRE	.008 <T	.	.	.	.
AUG	.010	.004 <T	BDL	.	.	.004 <T	.004 <T	.	.
SEP	.016	.006 <T	.004 <T	.	.004 <T	.	.	.	.
OCT	.004 <T	.002 <T	BDL	.	BDL	.	.	.	.
NOV	.012	BDL	BDL	.	BDL	.004 <T	.002 <T	.	.
DEC	INR	INR	BDL	INR	INR	BDL	BDL	.	.
NITRITE (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)				
JAN	.002 <T	BDL	BDL	.	.	.	.	BDL	BDL
FEB	.006	.002 <T	.002 <T	.002 <T	.002 <T	.	.	.003 <T	.002 <T
MAR	.007	.002 <T	.001 <T	.009	BDL	.008	.005	.	.
APR	.001 <T	.001 <T	BDL	.	.	.	.	.	.
MAY	.002 <T	BDL	BDL	.	BDL	ISD	ISD	.	.
JUN	.003 <T	.001 <T	BDL	.	.001 <T	.002 <T	.001 <T	.	.
JUL	.005	.002 <T	.002 <T	IRE	.002 <T	.	.	.	.
AUG	.003 <T	.004 <T	.001 <T	.	.	.002 <T	.001 <T	.	.
SEP	.005	.003 <T	.002 <T	.	.003 <T	.	.	.	.
OCT	.004 <T	.002 <T	BDL	.	BDL	.	.	.	.
NOV	.003 <T	.001 <T	BDL	.	.001 <T	.001 <T	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
DEC	!NR	!NR	BDL	!NR	!NR	BDL	BDL	.	.
TOTAL NITRATES (MG/L)			DET'N LIMIT = .020		GUIDELINE = 10.000 (A1)				
JAN	.410	.425	.435	.	.	.	.	.375	.375
FEB	.485	.490	.505	.445	.445	.	.	.410	.405
MAR	.635	.635	.610 UAL	.515	.410	.570	.570	.	.
APR	.335	.325	.400	.	.	.	.	.	.
MAY	.295	.305	.310	.	.315	!SD	!SD	.	.
JUN	.290	.285	.310	.	.290	.285	.280	.	.
JUL	.285	.280	.290	!RE	.290	.	.	.	.
AUG	.270	.270	.270	.	.	.270	.270	.	.
SEP	.235	.235	.230	.	.245	.	.	.	.
OCT	.245	.245	.245	.	.240	.	.	.	.
NOV	.310	.305	.300	.	.305	.320	.310	.	.
DEC	!NR	!NR	.315	!NR	!NR	.310	.315	.	.
NITROGEN TOT KJELD (MG/L)			DET'N LIMIT = .020		GUIDELINE = N/A				
JAN	.190	.120	.130	.	.	.	.	.110	.120
FEB	.190	.110	.070 <T	.080 <T	.080 <T	.	.	.150	.190
MAR	.200	.150	!SM	.180	.130	.140	.140	.	.
APR	.150	.090 <T	.080 <T	.	.	.	.	.	.
MAY	.180	.080 <T	.060 <T	.	.060 <T	.050 <T	.100	.	.
JUN	.130	.060 <T	BDL	.	.080 <T	.130	.080 <T	.	.
JUL	.140	.080 <T	.080 <T	!RE	.080 <T	.	.	.	.
AUG	.130	.100	.060 <T	.	.	.080 <T	.090 <T	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	.140	.100	.090 <T	.	.090 <T	.	.	.	.
OCT	.160	.130	.100	.	.110	.	.	.	.
NOV	.150	.100	.090 <T	.	.100	.090 <T	.090 <T	.	.
DEC	!SM	!SM	.070 <T	!SM	!SM	.100	.090 <T	.	.
PH (DMSNLESS)			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)				
JAN	8.240	8.050	8.000	.	.	.	.	8.000	7.960
FEB	8.040	7.780	7.690	7.760	7.740	.	.	7.740	7.740
MAR	8.280	8.170	!SM	8.070	8.050	8.050	8.060	.	.
APR	8.200	7.990	7.880	.	.	.	.	.	.
MAY	8.240	8.070	7.950	.	8.020	7.730	7.750	.	.
JUN	8.410	8.080	7.950	.	8.110	7.920	7.870	.	.
JUL	8.380	7.950	7.900	!RE	7.960	.	.	.	.
AUG	8.300	7.820	7.670	.	.	7.860	7.780	.	.
SEP	8.270	8.000	7.820	.	7.990	.	.	.	.
OCT	8.250	8.030	7.990	.	7.980	.	.	.	.
NOV	8.200	8.080	8.060	.	8.130	8.130	8.160	.	.
DEC	!NR	!NR	8.200	!NR	!NR	8.120	8.150	.	.
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = .5UG/L		GUIDELINE = N/A				
JAN	.003	BDL	.	.	.	.	.	.	.
FEB	.008	.001 <T	.	.	.	.	.	.	.
MAR	.009	.001 <T	.001 <T	.	.	.	.	.	.
APR	.005	.001 <T	.001 <T	.	.	.	.	.	.
MAY	.000	.000	.001 <T	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
JUN	.000 <T	.000 <T	.000 <T	.	.	.	.	.	.
JUL	.001 <T	.001 <T	.003	.	.	.	.	.	.
AUG	.000 <T	.000 <T	.001 <T	.	.	.	.	.	.
SEP	.000 <T	BDL	.000 <T	.	.	.	.	.	.
OCT	BDL	BDL	.003	.	.	.	.	.	.
NOV	.001 <T	.001 <T	.002	.	.	.	.	.	.
DEC	!NR	!NR	.004	.	.	.	.	.	.
PHOSPHORUS TTL-UNFIL (MG/L)		DET'N LIMIT = .002		GUIDELINE = .40 (F2)					
JAN	.010	.002	.	.	.	.	.	.	.
FEB	.014	BDL	.	.	.	.	.	.	.
MAR	.018	BDL	.003 <T	.	.	.	.	.	.
APR	.020	.007 <T	.004 <T	.	.	.	.	.	.
MAY	.004 <T	BDL	BDL	.	.	.	.	.	.
JUN	BDL	BDL	BDL	.	.	.	.	.	.
JUL	.002 <T	BDL	.003 <T	.	.	.	.	.	.
AUG	.002 <T	.005 <T	BDL	.	.	.	.	.	.
SEP	.006 <T	.003 <T	.003 <T	.	.	.	.	.	.
OCT	.003 <T	BDL	.007 <T	.	.	.	.	.	.
NOV	.002 <T	BDL	.002 <T	.	.	.	.	.	.
DEC	!SM	!SM	.004 <T	.	.	.	.	.	.
RESIDUE (TOTAL) (MG/L)		DET'N LIMIT = 1.		GUIDELINE = 500. (A3)					
JAN	163	147 CRO	146 CRO	.	.	.	.	144 CRO	144 CRO
FEB	150	162 CRO	163 CRO	155 CRO	155 CRO	.	.	153 CRO	151 CRO

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	155	164 CRO	160 CRO	157 CRO	154 CRO	165 CRO	166 CRO	.	.
APR	135 CRO	137 CRO	142 CRO	.	.	.	.	.	.
MAY	142 CRO	146 CRO	147 CRO	.	148 CRO	148 CRO	150 CRO	.	.
JUN	140 CRO	145 CRO	144 CRO	.	142 CRO	147 CRO	146 CRO	.	.
JUL	142 CRO	146 CRO	146 CRO	!RE	147 CRO	.	.	.	.
AUG	138 CRO	142 CRO	141 CRO	.	.	146 CRO	146 CRO	.	.
SEP	140 CRO	145 CRO	145 CRO	.	144 CRO	.	.	.	.
OCT	138 CRO	140 CRO	142 CRO	.	141 CRO	.	.	.	.
NOV	139 CRO	141 CRO	141 CRO	.	141 CRO	143 CRO	143 CRO	.	.
DEC	!NR	!NR	144 CRO	!NR	!NR	145 CRO	144 CRO	.	.
TURBIDITY (FTU)			DET'N LIMIT = .02		GUIDELINE = 1.00 (A1)				
JAN	13.300	.180	.200	.	.	.	.	.290	.170
FEB	12.800	.230	.100	.100	.470	.	.	.280	.180
MAR	20.000	.390	!SM	.140	.110	.200	.070	.	.
APR	1.330	.160	.210	.	.	.	.	.	.
MAY	1.470	.120	.040 <T	.	.090 <T	.230	.210	.	.
JUN	1.050	.100	.140	.	.120	.270	.120	.	.
JUL	1.560	.230	.120	!RE	.150	.	.	.	.
AUG	.860	.460	.330	.	.	.300	.240	.	.
SEP	2.000	.150	.110	.	.110	.	.	.	.
OCT	1.220	.520	1.150	.	.120	.	.	.	.
NOV	1.580	.130	.070 <T	.	.090 <T	.150 UNH	.110	.	.
DEC	!SM	!SM	.030 <T	!SM	!SM	.070 <T	.050 <T	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
METALS									
ALUMINUM (MG/L)			DET'N LIMIT = .004		GUIDELINE = .10 (A4)				
JAN	.190	.070	.063	.	.	.	.	.051	.062
FEB	.085	.031	.025	.041	.041	.	.	.045	.023
MAR	.300	.048	.043	.036	.039	.036	.035	.	.
APR	.009	.073	.067	.	.	.	.	.	.
MAY	.010	.087	.065	.	.075	.011	.041	.	.
JUN	.012	.080	.067	.	.100	.046	.062	.	.
JUL	BDL	.110	.150	IBT	.170	.	.	.	.
AUG	.028	.200	.160	.	.	.110	.120	.	.
SEP	.023	.210	.170	.	.140	.	.	.	.
OCT	.022	.130	.270	.	.110	.	.	.	.
NOV	IIS	.110	.098	.	.110	.033	.037	.	.
DEC	INR	INR	.017	INR	INR	.005	.022	.	.
BARIUM (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)				
JAN	.013	.012	.012	.	.	.	.	.012	.012
FEB	.016	.015	.015	.015	.014	.	.	.014	.013
MAR	.017	.014	.014	.014	.013	.014	.014	.	.
APR	.012	.011	.012	.	.	.	.	.	.
MAY	.013	.013	.013	.	.013	.014	.014	.	.
JUN	.013	.013	.012	.	.012	.013	.012	.	.
JUL	.014	.015	.014	IBT	.015	.	.	.	.
AUG	.011	.012	.011	.	.	.012	.012	.	.
SEP	.012	.012	.014	.	.014	.	.	.	.
OCT	.012	.012	.011	.	.011	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
NOV	!IS	.011	.011	.	.011	.011	.011	.	.
DEC	!NR	!NR	.011	!NR	!NR	.012	.012	.	.
BORON (MG/L)			DET'N LIMIT = 0.01		GUIDELINE = 5.000 (A1)				
JAN	.020	.020	.020	.	.	.	.	.020	.020
FEB	.020	.020	.020	.020	.020	.	.	BDL	.020
MAR	.020	BDL	BDL	BDL	.020	BDL	BDL	.	.
APR	.010 <T	.010 <T	.010 <T	.	.	.	.	.	.
MAY	.020 <T	.020 <T	.020 <T	.	.020 <T	.030 <T	.020 <T	.	.
JUN	.030	.030	.030	.	.020	.020	.020	.	.
JUL	.010 <T	.010 <T	BDL	!BT	.010 <T	.	.	.	.
AUG	.010 <T	.010 <T	!IS	.	.	BDL	BDL	.	.
SEP	BDL	BDL	.010 <T	.	.010 <T	.	.	.	.
OCT	BDL	.010 <T	BDL	.	.010 <T	.	.	.	.
NOV	.020 <T	.020 <T	.020 <T	.	.020 <T	.031 <T	.033 <T	.	.
DEC	!NR	!NR	.018 <T	!NR	!NR	.013 <T	.015 <T	.	.
CADMIUM (UG/L)			DET'N LIMIT = 0.300		GUIDELINE = 5.000 (A1)				
JAN	BDL	BDL	BDL	.	.	.	.	BDL	BDL
FEB	BDL	BDL	BDL	BDL	BDL	.	.	BDL	BDL
MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUL	3.000	BDL	BDL	!BT	BDL	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	BDL	BDL	BDL	.	.	BDL	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	!IS	BDL	BDL	.	BDL	BDL	BDL	.	.
DEC	!NR	!NR	BDL	!NR	!NR	BDL	BDL	.	.
COBALT (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = 1.0 (H)				
JAN	BDL	BDL	BDL	.	.	.	.	BDL	BDL
FEB	BDL	BDL	BDL	BDL	BDL	.	.	BDL	BDL
MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUL	BDL	BDL	BDL	!BT	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	BDL	BDL	.	.
SEP	.001	.001	BDL	.	.001	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	!IS	BDL	BDL	.	BDL	BDL	BDL	.	.
DEC	!NR	!NR	BDL	!NR	!NR	BDL	BDL	.	.
CHROMIUM (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = .05 (A1)				
JAN	BDL	BDL	BDL	.	.	.	.	BDL	BDL
FEB	BDL	BDL	BDL	BDL	BDL	.	.	BDL	BDL
MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	BDL	.001	BDL	.	.001	BDL	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUL	BDL	BDL	BDL	!BT	BDL	.	.	.	.
AUG	BDL	.001	.001	.	.	.001	.001	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	.001	.001	.001	.	.001	.	.	.	.
NOV	!IS	.001	.001	.	.001	.001	.001	.	.
DEC	!NR	!NR	.002	!NR	!NR	.001	.001	.	.
COPPER (MG/L)			DET'N LIMIT = .001		GUIDELINE = 1.0 (A3)				
JAN	.003	.004	.001	.	.	.	.	.220	.010
FEB	.002	.006	.001	.023	.005	.	.	.083	.010
MAR	.002	.001	.003	.020	.003	.680	.057	.	.
APR	BDL	.002	BDL	.	.	.	.	.	.
MAY	.001	.004	BDL	.	.004	1.500	.066	.	.
JUN	.001	.001	.003	.	.003	.650	.069	.	.
JUL	.004	.002	.001	!BT	.004	.	.	.	.
AUG	.006	.005	.004	.	.	.380	.120	.	.
SEP	BDL	.003	.001	.	.003	.	.	.	.
OCT	.002	.002	.001	.	.004	.	.	.	.
NOV	!IS	.002	BDL	.	.003	.350	.028	.	.
DEC	!NR	!NR	BDL	!NR	!NR	1.000	.200	.	.
IRON (MG/L)			DET'N LIMIT = .002		GUIDELINE = .300 (A3)				
JAN	.180	.004	BDL	.	.	.	.	.009	.016

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
FEB	.130	.006	.002	.010	.003	.	.	.011	.014
MAR	.300	.004	.003	.012	.004	.008	.005	.	.
APR	.015	.001	.002	.	.	.	.	.	.
MAY	.046	BDL	.033	.	BDL	.004	.022	.	.
JUN	.110	.022	.076	.	.075	BDL	BDL	.	.
JUL	.019	BDL	BDL	!BT	BDL	.	.	.	.
AUG	BDL	.037	BDL	.	.	BDL	.006	.	.
SEP	.008	.015	.410	.	.006	.	.	.	.
OCT	.030	BDL	.014	.	BDL	.	.	.	.
NOV	!IS	.004	.004	.	.005	.004	.018	.	.
DEC	!NR	!NR	BDL	!NR	!NR	.008	.003	.	.
MERCURY (UG/L)			DET'N LIMIT = 0.010		GUIDELINE = 1.000 (A1)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	.010	.010	BDL	.	BDL	.	.	.	.010
MAR	.010	.010	BDL	.	BDL	.	BDL	.	.
APR	BDL	.010	BDL	.	.	.	.	.	.
MAY	.010	.010	BDL	.	BDL	.	BDL	.	.
JUN	.020	.020	BDL	.	BDL	.	.010	.	.
JUL	.010	.010	.010	.	BDL	.	.	.	.
AUG	.020	.020	.010	.	.	.	.020	.	.
SEP	.030	.030	BDL	.	.030	.	.	.	.
OCT	.020	.020	.020	.	.010	.	.	.	.
NOV	.020	.020	.010	.	.010	.	.010	.	.
DEC	!SS	!SS	BDL	.	!SS	.	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MANGANESE (MG/L)			DET'N LIMIT = .001		GUIDELINE = .050 (A3)				
JAN	.005	.001	BDL	.	.	.	.	.001	.002
FEB	.005	.001	BDL	BDL	BDL	.	.	BDL	BDL
MAR	.007	.001	.001	BDL	BDL	.001	.001	.	.
APR	.001	BDL	BDL	.	.	.	.	.	.
MAY	.001	.001	BDL	.	BDL	.001	.001	.	.
JUN	.002	.001	.001	.	BDL	.001	BDL	.	.
JUL	.001	.001	.001	!BT	.001	.	.	.	.
AUG	.001	.001	BDL	.	.	.001	.001	.	.
SEP	.001	BDL	.001	.	BDL	.	.	.	.
OCT	.002	BDL	.001	.	BDL	.	.	.	.
NOV	!IS	.001	.001	.	.001	.002	.002	.	.
DEC	!NR	!NR	BDL	!NR	!NR	.002	.001	.	.
MOLYBDENUM (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = .50 (H)				
JAN	BDL	BDL	BDL	.	.	.	.	BDL	.001
FEB	BDL	BDL	.001	BDL	.001	.	.	BDL	.001
MAR	BDL	BDL	.001	BDL	BDL	BDL	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUL	BDL	.001	BDL	!BT	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	BDL	BDL	.	.
SEP	.001	.001	BDL	.	.001	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	!IS	BDL	BDL	.	BDL	BDL	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
DEC	!NR	!NR	BDL	!NR	!NR	BDL	BDL	.	.
NICKEL (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = .05 (F3)				
JAN	BDL	.002	BDL	.	.	.	.	BDL	BDL
FEB	BDL	.003	BDL	BDL	BDL	.	.	BDL	BDL
MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	.002	BDL	.	BDL	BDL	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUL	BDL	.002	BDL	!BT	.002	.	.	.	.
AUG	BDL	.002	BDL	.	.	BDL	BDL	.	.
SEP	.004	.004	BDL	.	BDL	.	.	.	.
OCT	.001	.001	BDL	.	.001	.	.	.	.
NOV	!IS	.002	.002	.	.002	BDL	BDL	.	.
DEC	!NR	!NR	.001	!NR	!NR	.001	BDL	.	.
LEAD (MG/L)			DET'N LIMIT = 0.003		GUIDELINE = .050 (A1)				
JAN	BDL	BDL	BDL	.	.	.	.	.025	BDL
FEB	BDL	BDL	BDL	BDL	BDL	.	.	.014	BDL
MAR	.005	.004	BDL	.007	.005	.042	.006	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.063	BDL	.	.
JUN	BDL	BDL	.004	.	BDL	.030	.006	.	.
JUL	BDL	BDL	BDL	!BT	BDL	.	.	.	.
AUG	.005	BDL	BDL	.	.	.020	.009	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

SITE	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	!IS	BDL	.005	.	.005	.012	BDL	.	.
DEC	!NR	!NR	BDL	!NR	!NR	.044	BDL	.	.
STRONTIUM (MG/L)			DET'N LIMIT = .001		GUIDELINE = 2.00 (H)				
JAN	.095	.096	.098	.	.	.	.	.093	.093
FEB	.150	.160	.150	.130	.130	.	.	.120	.120
MAR	.170	.160	.160	.130	.130	.150	.150	.	.
APR	.092	.091	.100	.	.	.	.	.	.
MAY	.120	.130	.130	.	.140	.140	.150	.	.
JUN	.100	.100	.100	.	.097	.100	.100	.	.
JUL	.120	.120	.120	!BT	.120	.	.	.	.
AUG	.096	.095	.089	.	.	.098	.098	.	.
SEP	.130	.130	.120	.	.120	.	.	.	.
OCT	.089	.090	.088	.	.088	.	.	.	.
NOV	!IS	.087	.090	.	.088	.091	.092	.	.
DEC	!NR	!NR	.088	!NR	!NR	.092	.090	.	.
URANIUM (UG/L)			DET'N LIMIT = .02		GUIDELINE = 20. (A2)				
JAN	.350	.260	.270	.	.	.	.	BDL	.240
FEB	.270	.210	.210	BDL	BDL	.	.	BDL	BDL
MAR	.260	.210	.190	.160	.150	.130	.180	.	.
APR	.150 <T	.150 <T	.150 <T	.	.	.	.	.	.
MAY	.220	.150	.140	.	.150	.040	.130	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	.150	.050	.060	.	.110	.040	.030	.	.
JUL	.220	.060	.100	IBT	.110	.	.	.	.
AUG	.020	.010	IIS	.	.	.020	.020	.	.
SEP	.190	.140	.130	.	.120	.	.	.	.
OCT	.400	.230	.290	.	.270	.	.	.	.
NOV	.220	.150	.160	.	.170	.120	.150	.	.
DEC	INR	INR	.100	INR	INR	BDL	.100	.	.
VANADIUM (MG/L)			DET'N LIMIT = .001		GUIDELINE = .10 (H)				
JAN	.001	BDL	BDL	.	.	.	.	BDL	BDL
FEB	.001	BDL	BDL	BDL	BDL	.	.	BDL	BDL
MAR	.001	BDL	BDL	BDL	.001	BDL	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	BDL	BDL	.	.
JUL	BDL	BDL	BDL	IBT	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	BDL	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	IIS	BDL	BDL	.	BDL	BDL	BDL	.	.
DEC	INR	INR	BDL	INR	INR	BDL	BDL	.	.
ZINC (MG/L)			DET'N LIMIT = .001		GUIDELINE = 5.00 (A3)				
JAN	.004	.010	.001	.	.	.	.	.048	.002
FEB	.002	.012	.001	.025	.003	.	.	.012	.002

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2						
			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.003	.005	.004	.014	.003	.022	.004	.	.
APR	.002	.005	BDL	.	.	.	.	.	.
MAY	.004	.007	.002	.	.003	.091	.008	.	.
JUN	.002	.011	BDL	.	.002	.024	.005	.	.
JUL	.012	.018	.005	!BT	.006	.	.	.	.
AUG	.130	.300	.310	.	.	.440	.540	.	.
SEP	.002	.007	.001	.	.004	.	.	.	.
OCT	.005	.003	BDL	.	.003	.	.	.	.
NOV	!IS	.006	BDL	.	.002	.015	.003	.	.
DEC	!NR	!NR	.002	!NR	!NR	.190	.004	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
CHLOROAROMATICS									
123 TRICHLOROBENZENE (NG/L)			DET'N LIMIT = 5.000		GUIDELINE = 10000. (I)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	14.000 <T	.	BDL	.	.
JUN	BDL	17.000 <T	5.000 <T	.	15.000 <T	.	13.000 <T	.	.
JUL	BDL	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	!LA	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!IS	!IS	BDL	.	!IS	.	BDL	.	.
1245 T-CHLOROBENZENE (NG/L)			DET'N LIMIT = 1.000		GUIDELINE = 38000. (D4)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	1.000 <T	BDL	BDL	.	BDL	.	BDL	.	.
JUL	BDL	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	!LA	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!IS	!IS	BDL	.	!IS	.	BDL	.	.
135 TRICHLOROBENZENE (NG/L)			DET'N LIMIT = 5.000		GUIDELINE = 10000. (D4)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	11.000 <T	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUL	BDL	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	!LA	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!IS	!IS	BDL	.	!IS	.	BDL	.	.
HEXACHLOROETHANE (NG/L)			DET'N LIMIT = 1.000		GUIDELINE = 1900. (D4)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	9.000 <T	3.000 <T	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	2.000 <T	BDL	.	BDL	.	BDL	.	.
JUL	BDL	BDL	BDL	.	BDL	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

SITE	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
AUG	BDL	2.000 <T	2.000 <T	.	.	.	5.000 <T	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	!LA	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!IS	!IS	BDL	.	!IS	.	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
PESTICIDES & PCB									
ALPHA BHC (NG/L)			DET'N LIMIT = 1.000		GUIDELINE = 700. (G)				
JAN	3.000 <T	3.000 <T	3.000 <T	.	.	.	.	.	3.000 <T
FEB	2.000 <T	2.000 <T	2.000 <T	.	2.000 <T	.	.	.	4.000 <T
MAR	3.000 <T	2.000 <T	2.000 <T	.	2.000 <T	.	1.000 <T	.	.
APR	1.000 <T	2.000 <T	2.000 <T	.	.	.	.	.	.
MAY	BDL	3.000 <T	3.000 <T	.	2.000 <T	.	3.000 <T	.	.
JUN	2.000 <T	3.000 <T	2.000 <T	.	3.000 <T	.	3.000 <T	.	.
JUL	BDL	2.000 <T	BDL	.	BDL	.	.	.	.
AUG	2.000 <T	3.000 <T	3.000 <T	.	.	.	2.000 <T	.	.
SEP	BDL	2.000 <T	BDL	.	3.000 <T	.	.	.	.
OCT	2.000 <T	BDL	2.000 <T	.	!LA	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	2.000 <T	.	.
DEC	!IS	!IS	2.000 <T.	.	!IS	.	3.000 <T	.	.
LINDANE (NG/L)			DET'N LIMIT = 1.000		GUIDELINE = 4000.0 (A1)				
JAN	BDL	BDL	1.000 <T	.	.	.	.	.	1.000 <T
FEB	BDL	1.000 <T	BDL	.	BDL	.	.	.	1.000 <T
MAR	1.000 <T	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	1.000 <T	2.000 <T	.	BDL	.	1.000 <T	.	.
JUN	BDL	1.000 <T	1.000 <T	.	2.000 <T	.	1.000 <T	.	.
JUL	BDL	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	!LA	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

SITE	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!IS	!IS	BDL	.	!IS	.	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
NOV	.100 UCS	.100 UCS	.150 UCS	.	.100 UCS	.	.150 UCS	.	.
DEC	!SM	!SM	BDL	.	!SM	.	BDL	.	.
ETHYLBENZENE (UG/L)		DET'N LIMIT = 0		GUIDELINE = 3400. (D3)					
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUL	.	.150 <T	.150 <T	.	.100 <T	.	.	.	.
AUG	BDL	.150 <T	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	.100 <T	.	BDL	.	.	.	.
NOV	BDL	.050 <T	.150 <T	.	BDL	.	BDL	.	.
DEC	!SM	!SM	BDL	.	!SM	.	BDL	.	.
1,1 DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0		GUIDELINE = 7.0 (D1)					
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	.000 SPS	.	BDL	.	.000 SPS	.	.
JUL	.	BDL	BDL	.	BDL	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
VOLATILES									
BENZENE (UG/L)			DET'N LIMIT = 0	GUIDELINE = 5.0 (D1)					
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	.100 <T	.	BDL	.	.150 <T	.	.
JUL	.	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	.100 <T	.	BDL	.	BDL	.	.
DEC	!SM	!SM	BDL	.	!SM	.	BDL	.	.
TOLUENE (UG/L)			DET'N LIMIT = 0	GUIDELINE = 100.0 (G)					
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	.	.100 <T	.	.
JUL	.	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	.000 APS	.	BDL	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
MAY	BDL	18.000	17.000	.	20.000	.	27.000	.	.
JUN	BDL	22.000	25.100	.	23.000	.	22.200	.	.
JUL	.	17.000	19.000	.	19.000	.	.	.	.
AUG	BDL	17.500	17.700	.	.	.	23.500	.	.
SEP	BDL	17.200	17.900	.	18.400	.	.	.	.
OCT	BDL	13.000	17.900	.	22.600	.	.	.	.
NOV	BDL	18.900	24.200	.	19.200	.	15.000	.	.
DEC	!SM	!SM	22.200	.	!SM	.	19.200	.	.
TRICHLOROETHYLENE (UG/L)			DET'N LIMIT = 0		GUIDELINE = 5.0 (D1)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	.200 <T	BDL	.	BDL	.	BDL	.	.
JUL	.	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!SM	!SM	BDL	.	!SM	.	BDL	.	.
DICHLOROBROMOMETHANE (UG/L)			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)				
JAN	BDL	7.000	6.000	.	.	.	.	.	8.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	.000 APS	.000 APS	.	.000 APS	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!SM	!SM	BDL	.	!SM	.	BDL	.	.
1,1 DICHLOROETHANE (UG/L)			DET'N LIMIT = 0		GUIDELINE = N/A				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUL	.	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	.000 APS	.	BDL	.	BDL	.	.
DEC	!SM	!SM	BDL	.	!SM	.	BDL	.	.
CHLOROFORM (UG/L)			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)				
JAN	BDL	10.000	20.000	.	.	.	.	.	24.000
FEB	BDL	12.000	20.000	.	17.000	.	.	.	17.000
MAR	BDL	12.000	22.000	.	27.000	.	18.000	.	.
APR	BDL	14.000	23.000	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2						
			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
PHENOLICS									
PHENOL (UG/L)			DET'N LIMIT = 0.2		GUIDELINE = 2.00 (A3)				
JAN	.	BDL	.	.	.	.	.	.	.200 <T
FEB	.600 <T	BDL	BDL	.	.	.	.	.	.
MAR	.400 <T	.400 <T	.400 <T	.	.	.	.	.	.
APR	.200 <T	BDL	BDL	.	.	.	.	.	.
MAY	1.400	.200 <T	.400 <T	.	.	.	.	.	.
JUN	.200 <T	.200 <T	.400 <T	.	.	.	.	.	.
JUL	BDL	BDL	BDL	.	.	.	.	.	.
AUG	.200 <T	BDL	BDL	.	.	.	.	.	.
SEP	.400 <T	BDL	.	.	.	.	.	.	.
OCT	BDL	BDL	BDL	.	.	.	.	.	.
NOV	BDL	BDL	BDL	.	.	.	.	.	.
DEC	!SM	!SM	BDL	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE	RAW	TREATED1	TREATED2	SITE1		SITE 2		SITE 3	
TYPE			FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SPECIFIC PESTICIDES									
ATRAZINE (NG/L)			DET'N LIMIT = 50.00		GUIDELINE = 60000. (B3)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	100.000 <T	80.000 <T	60.000 <T	.	BDL	.	70.000 <T	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUL	!PE	!PE	!PE	.	!PE	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	BDL	.	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	!IS	!IS	BDL	.	!IS	.	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2 FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
FEB	BDL	8.000	8.000	.	9.000	.	.	.	8.000
MAR	BDL	7.000	10.000	.	9.000	.	9.000	.	.
APR	BDL	8.000	10.000	.	.	.	.	.	.
MAY	BDL	9.000	8.000	.	8.000	.	10.000	.	.
JUN	BDL	10.000	10.900	.	11.000	.	10.400	.	.
JUL	.	11.000	11.000	.	11.000	.	.	.	.
AUG	BDL	10.400	9.700	.	.	.	11.300	.	.
SEP	BDL	10.800	10.500	.	11.400	.	.	.	.
OCT	BDL	8.800	9.400 APS	.	10.000	.	.	.	.
NOV	BDL	10.000	9.900	.	10.000	.	8.950	.	.
DEC	!SM	!SM	11.100	.	!SM	.	9.700	.	.
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)				
JAN	BDL	4.000	3.000	.	.	.	.	.	3.000
FEB	BDL	4.000	4.000	.	4.000	.	.	.	3.000
MAR	BDL	4.000	3.000	.	4.000	.	3.000	.	.
APR	BDL	4.000	4.000	.	.	.	.	.	.
MAY	BDL	5.000	4.000	.	3.000	.	4.000	.	.
JUN	BDL	7.000	4.800	.	6.000	.	4.800	.	.
JUL	.	8.000	8.000	.	9.000	.	.	.	.
AUG	BDL	5.500	4.700	.	.	.	5.200	.	.
SEP	BDL	5.000	5.100	.	5.000	.	.	.	.
OCT	BDL	4.800	4.400	.	4.500	.	.	.	.
NOV	BDL	4.000	4.000	.	4.100	.	4.200	.	.
DEC	!SM	!SM	3.800	.	!SM	.	4.000	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
T-CHLOROETHYLENE (UG/L)			DET'N LIMIT = 0		GUIDELINE = 10.0 (C2)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUL	.	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	BDL	BDL	.	.	.	BDL	.	.
SEP	BDL	.150 <T	BDL	.	BDL	.	.	.	.
OCT	BDL	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	BDL	.	BDL	.	BDL	.	.
DEC	ISM	ISM	BDL	.	ISM	.	BDL	.	.
BROMOFORM (UG/L)			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)				
JAN	BDL	BDL	BDL	.	.	.	.	.	BDL
FEB	BDL	BDL	BDL	.	BDL	.	.	.	BDL
MAR	BDL	BDL	BDL	.	BDL	.	BDL	.	.
APR	BDL	BDL	BDL	.	.	.	.	.	.
MAY	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUN	BDL	BDL	BDL	.	BDL	.	BDL	.	.
JUL	.	BDL	BDL	.	BDL	.	.	.	.
AUG	BDL	.600 <T	.600 <T	.	.	.	BDL	.	.
SEP	BDL	.400 <T	.400 <T	.	.400 <T	.	.	.	.
OCT	BDL	.200 <T	.200 <T	.	.200 <T	.	.	.	.
NOV	BDL	.200 <T	.200 <T	.	.200 <T	.	.400 <T	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

	WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE				SITE1		SITE 2		SITE 3	
TYPE	RAW	TREATED1	TREATED2	STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			FREE FLOW						
DEC	!SM	!SM	BDL	.	!SM	.	BDL	.	.
TOTL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1)				
JAN	BDL	21.000	29.000	.	.	.	.	.	35.000
FEB	BDL	24.000	32.000	.	30.000	.	.	.	28.000
MAR	BDL	23.000	35.000	.	40.000	.	30.000	.	.
APR	BDL	26.000	37.000	.	.	.	.	.	.
MAY	BDL	32.000	29.000	.	31.000	.	41.000	.	.
JUN	BDL	39.000	40.800	.	40.000	.	37.400	.	.
JUL	.	36.000	38.000	.	39.000	.	.	.	.
AUG	BDL	34.000	32.700	.	.	.	40.000	.	.
SEP	BDL	33.400	33.900	.	35.200	.	.	.	.
OCT	BDL	26.800	31.900	.	37.300	.	.	.	.
NOV	BDL	33.100	38.300	.	33.500	.	28.550	.	.
DEC	!SM	!SM	37.100	.	!SM	.	32.900	.	.

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN	PARAMETER	ANALYSED	DETECTION LIMIT	GUIDELINE		
CHEMISTRY (LAB)	CYANIDE	53	0.001	.200	(A1)	MG/L
METALS	ARSENIC	65	0.001	.050	(A1)	MG/L
	BERYLLIUM	65	0.001	.0002	(H)	MG/L
	CYANIDE	53	0.001	.200	(A1)	MG/L
	SELENIUM	65	0.001	.010	(A1)	MG/L
CHLOROAROMATICS	HEXACHLOROBUTADIENE	53	1.000	450.	(D4)	NG/L
	1234 T-CHLOROBENZENE	53	1.000	10000.	(I)	NG/L
	1235 T-CHLOROBENZENE	53	1.000	10000.	(I)	NG/L
	124 TRICHLOROBENZENE	53	5.000	10000.	(I)	NG/L
	OCTACHLOROSTYRENE	53	1.000		N/A	NG/L
	PENTACHLOROBENZENE	53	1.000	74000.	(D4)	NG/L
	236 TRICHLOROTOLUENE	53	5.000		N/A	NG/L
	245 TRICHLOROTOLUENE	53	5.000		N/A	NG/L
	26A TRICHLOROTOLUENE	53	5.000		N/A	NG/L
CHLOROPHENOLS	234 TRICHLOROPHENOL	6	50.		N/A	NG/L
	2345 T-CHLOROPHENOL	6	50.		N/A	NG/L
	2356 T-CHLOROPHENOL	6	50.		N/A	NG/L
	245-TRICHLOROPHENOL	6	50.	2600000	(D4)	NG/L
	246-TRICHLOROPHENOL	6	50.	10000.	(C1)	NG/L
	PENTACHLOROPHENOL	6	50.	10000.	(C1)	NG/L
PAH	PHENANTHRENE	11	0		N/A	NG/L
	ANTHRACENE	11	0		N/A	NG/L
	FLUORANTHENE	11	0	42000	(D4)	NG/L
	PYRENE	11	0		N/A	NG/L
	BENZO(A)ANTHRACENE	11	0		N/A	NG/L
	CHRYSENE	11	0		N/A	NG/L
	DIMETH. BENZ(A)ANTHR	11	0		N/A	NG/L
	BENZO(E)PYRENE	11	0		N/A	NG/L
	BENZO(J) FLUORANTHEN	11	N/A		N/A	NG/L
	BENZO(B) FLUORANTHEN	11	0		N/A	NG/L
	PERYLENE	11	0		N/A	NG/L
	BENZO(K) FLUORANTHEN	11	N/A		N/A	NG/L
	BENZO (A) PYRENE	11	0	10	(B1)	NG/L
	BENZO(G,H,I) PERYLEN	11	0		N/A	NG/L
	DIBENZO(A,H) ANTHRAC	11	0		N/A	NG/L
	INDENO(1,2,3-C,D) PY	11	0		N/A	NG/L
	BENZO(B) CHRYSENE	11	0		N/A	NG/L
	ANTHANTHRENE	11	N/A		N/A	NG/L
	CORONENE	11	0		N/A	NG/L
PESTICIDES & PCB	ALDRIN	53	1.000	700.0	(A1)	NG/L
	BETA BHC	53	1.000	300.	(G)	NG/L
	ALPHA CHLORDANE	53	2.000	7000.0	(A1)	NG/L
	GAMMA CHLORDANE	53	2.000	7000.0	(A1)	NG/L
	DIELDRIN	53	2.000	700.0	(A1)	NG/L
	METHOXYCHLOR	53	5.000	100000.	(A1)	NG/L
	THIODAN I	53	2.000	74000.	(D4)	NG/L

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN	PARAMETER	ANALYSED	DETECTION LIMIT	GUIDELINE	
PESTICIDES & PCB	THIODAN II	53	4.000	74000. (D4)	NG/L
	ENDRIN	53	4.000	200.0 (A1)	NG/L
	THIODAN SULPHATE	53	4.000	N/A	NG/L
	HEPTACHLOR EPOXIDE	53	1.000	3000.0 (A1)	NG/L
	HEPTACHLOR	53	1.000	3000.0 (A1)	NG/L
	MIREX	53	5.000	N/A	NG/L
	OXYCHLORDANE	53	2.000	N/A	NG/L
	OPDDT	53	5.000	30000. (A1)	NG/L
	PCB	53	20.000	3000. (A2)	NG/L
	PP-DDD	53	5.000	N/A	NG/L
	PPDDE	53	1.000	30000. (A1)	NG/L
	PPDDT	53	5.000	30000. (A1)	NG/L
	ATRATONE	52	50.	N/A	NG/L
	ALACHLOR	52	500.	35000. (D2)	NG/L
	ETHYLENE DIBROMIDE	52	0	50.0 (G)	UG/L
	HCB	53	1.000	10.0 (C1)	NG/L
SPECIFIC PESTICIDES	TOXAPHENE	53	N/A	5000. (A1)	NG/L
	AMETRYNE	52	50.00	300000.(D3)	NG/L
	BLADEX	52	100.00	10000. (B3)	NG/L
	PROMETONE	52	50.00	52500. (D3)	NG/L
	PROPAZINE	52	50.00	16000. (D2)	NG/L
	PROMETRYNE	52	50.00	1000. (B3)	NG/L
	SENCOR	52	100.00	80000. (B2)	NG/L
	SIMAZINE	52	50.00	10000. (B3)	NG/L
	2,4,5-T	6	50.00	35000. (D2)	NG/L
	2,4-D	6	100.00	100000.(A1)	NG/L
	24DCHLRPHENOXYBUTYRC	6	200.00	18000. (B3)	NG/L
	2,4-DP	6	100.00	N/A	NG/L
	DICAMBA	6	100.00	87000. (B3)	NG/L
	PICHLORAM	6	100.00	2450000(D3)	NG/L
	SILVEX	6	50.00	10000. (A1)	NG/L
	DIAZINON	6	20.	14000. (A1)	NG/L
	DICHLOROVOS	6	20.	N/A	NG/L
	DURSBAN	6	20.	N/A	NG/L
	ETHION	6	20.	35000. (G)	NG/L
	GUTHION	6	N/A	N/A	NG/L
	MALATHION	6	20.	160000. (G)	NG/L
	MEVINPHOS	6	20.	N/A	NG/L
	METHYL PARATHION	6	50.	7000. (B3)	NG/L
	METHYLTRITHION	6	20.	N/A	NG/L
	PARATHION	6	20.	35000. (B1)	NG/L
	PHORATE	6	20.	35.0 (D2)	NG/L
	RELDAN	6	20.	N/A	NG/L
	RONNEL	6	20.	N/A	NG/L
	AMINOCARB	6	N/A	N/A	NG/L
	BENOMYL	6	N/A	N/A	NG/L
	BUX	6	2000.	N/A	NG/L
	CARBOFURAN	6	2000.	18000. (D3)	NG/L
	CIPC	6	2000.	350000. (G)	NG/L
	DIALLATE	6	2000.	30000. (H)	NG/L
	EPTAM	6	2000.	N/A	NG/L

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM LAKE HURON WATER SUPPLY SYSTEM 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN	PARAMETER	ANALYSED	DETECTION LIMIT	GUIDELINE	
SPECIFIC PESTICIDES	IPC	6	2000.	N/A	NG/L
	PROPOXUR	6	2000.	90000. (G)	NG/L
	SEVIN	6	200.	70000. (A1)	NG/L
	SUTAN	6	2000.	245000.(D3)	NG/L
	METOLACHLOR	52	500.	50000. (B3)	NG/L
VOLATILES	P-XYLENE	52	0	620. (G)	UG/L
	M-XYLENE	52	0	620. (G)	UG/L
	O-XYLENE	52	0	620. (G)	UG/L
	DICHLOROMETHANE	52	0	1750. (D3)	UG/L
	T1,2DICHLOROETHYLENE	52	0	350. (D3)	UG/L
	111, TRICHLOROETHANE	52	0	200. (D1)	UG/L
	1,2 DICHLOROETHANE	52	0	5.0 (D1)	UG/L
	CARBON TETRACHLORIDE	52	0	5.0 (D1)	UG/L
	1,2 DICHLOROPROPANE	52	0	10.0 (G)	UG/L
	112 TRICHLOROETHANE	52	0	.60 (D4)	UG/L
	1122 T-CHLOROETHANE	52	0	0.17 (D4)	UG/L
	CHLOROBENZENE	52	0	1510. (D3)	UG/L
	1,4 DICHLOROBENZENE	52	0	75.0 (D1)	UG/L
	1,3 DICHLOROBENZENE	52	0	130. (G)	UG/L
	1,2 DICHLOROBENZENE	52	0	130. (G)	UG/L
	TRIFLUOROCHLOROTOLUE	52	0	N/A	UG/L
	ETHYLENE DIBROMIDE	52	0	50.0 (G)	UG/L

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality,
- a flagging mechanism for 'Objective' exceedence,
- a definition of contaminant levels and trends,
- a comprehensive background for remedial action,
- a framework for assessment of new contaminants,
- and an indication of treatment efficiency of plant processes.

Program

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario; currently 44 plants are being monitored. Water supply locations have been prioritized for surveillance, based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit. It is estimated that after 4 years of operation, the program will be monitoring 90 locations.

A major goal of the program is to collect valid water quality data, in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analysed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling in order to acquire complete plant process and distribution system details, and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of the raw (ambient water) and the treated water at the treatment plant, and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled.

Sampling is carried out by operational personnel who have been trained in the applicable procedures.

Comprehensive standardized procedures and Field Test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". All laboratory analyses are carried out by the MOE Laboratory Services Branch.

Data Reporting Mechanism

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP co-ordinator.

DWSP INPUTS AND OUTPUTS

The DWSP INPUTS and OUTPUTS are illustrated in Fig. 1.

PROGRAM INPUTS

PLANT AND DISTRIBUTION SYSTEM DESCRIPTION

The system description includes plant specific non-analytical information acquired through a questionnaire and initial plant visit. During the initial assessment of the plant and distribution system the questionnaire content is verified and

missing information added. It is intended that all data be kept current with scheduled annual updates.

The PLANT and DISTRIBUTION SYSTEM DESCRIPTION consists of the following seven components.

1. Process component inventory

All physical and chemical processes that the water is subjected to, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. Treatment chemicals

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. The chemical dosages applied on the day of sampling are recorded in DWSP.

3. Process control measurements

Documentation of in-plant monitoring of process parameters (turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. In-plant monitoring results are generally not retained in DWSP but are retained by the Water Treatment Plant.

4. Design flow and retention time

The hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. The maximum, minimum and average flow as well as a record of the flow rate on the day of sampling are recorded in DWSP.

5. Distribution system description

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. Sampling system

Each plant is assessed for its adequacy in terms of sampling of bacteriological, organic and inorganic parameters. The prime considerations in the assessment and design of the sampling system are:

i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

ii/ the water being sampled is not being modified by the sampling system;

iii/ the sample tap must be in a clean area of the plant, preferably a lab area;

iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap), pump characteristics (model, type, capacity) and flow rate.

7. People

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate Ministry of Environment personnel associated with the plant.

FIELD DATA

The second major input to DWSP is field data.

Field data is collected at the plant and from the distribution system sites on the day of sampling. The field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling as well as monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analysed according to standardized DWSP protocols to allow for interplant comparison.

LABORATORY ANALYTICAL DATA

The third major input to DWSP is Laboratory Analytical Data.

Samples gathered from the raw, treated and distribution sampling sites are analyzed for approximately 160 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. The parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments parameters may be measured for in a "scan" producing some results for parameters that are not on the DWSP priority list but which may be of interest. The majority of the parameters are measured on a routine basis however, those that are technically more difficult and/or costly to analyse for are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change notation will be made and intercomparison data documented.

PARAMETER REFERENCE INFORMATION

The fourth major input to DWSP is Parameter Reference Information

This is a catalogue of information for each substance analysed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database.

An example is shown in fig. 2.

A written copy (hard version) of the Parameter Reference Information will be available in the near future and is a new and sophisticated enhancement to the DWSP.

PROGRAM OUTPUTS

There are four major program outputs, Query, Action Alert, Report Generation and the Annual Report.

QUERY

All DWSP information is easily accessed through the Query function, therefore anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

ACTION ALERTS

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the publication, Ontario Drinking Water Objectives (ISBN 0-7729-2725-1 revised 1983). This publication contains health-related Maximum Acceptable Concentrations for thirty substances. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedences at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, other agency guidelines which are documented in the Parameter Reference Information may be used. If these guidelines are exceeded the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

REPORT GENERATION

Custom reports can be generated from DWSP to meet the needs of the regions and to respond to public requests.

ANNUAL REPORTS

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG. 1

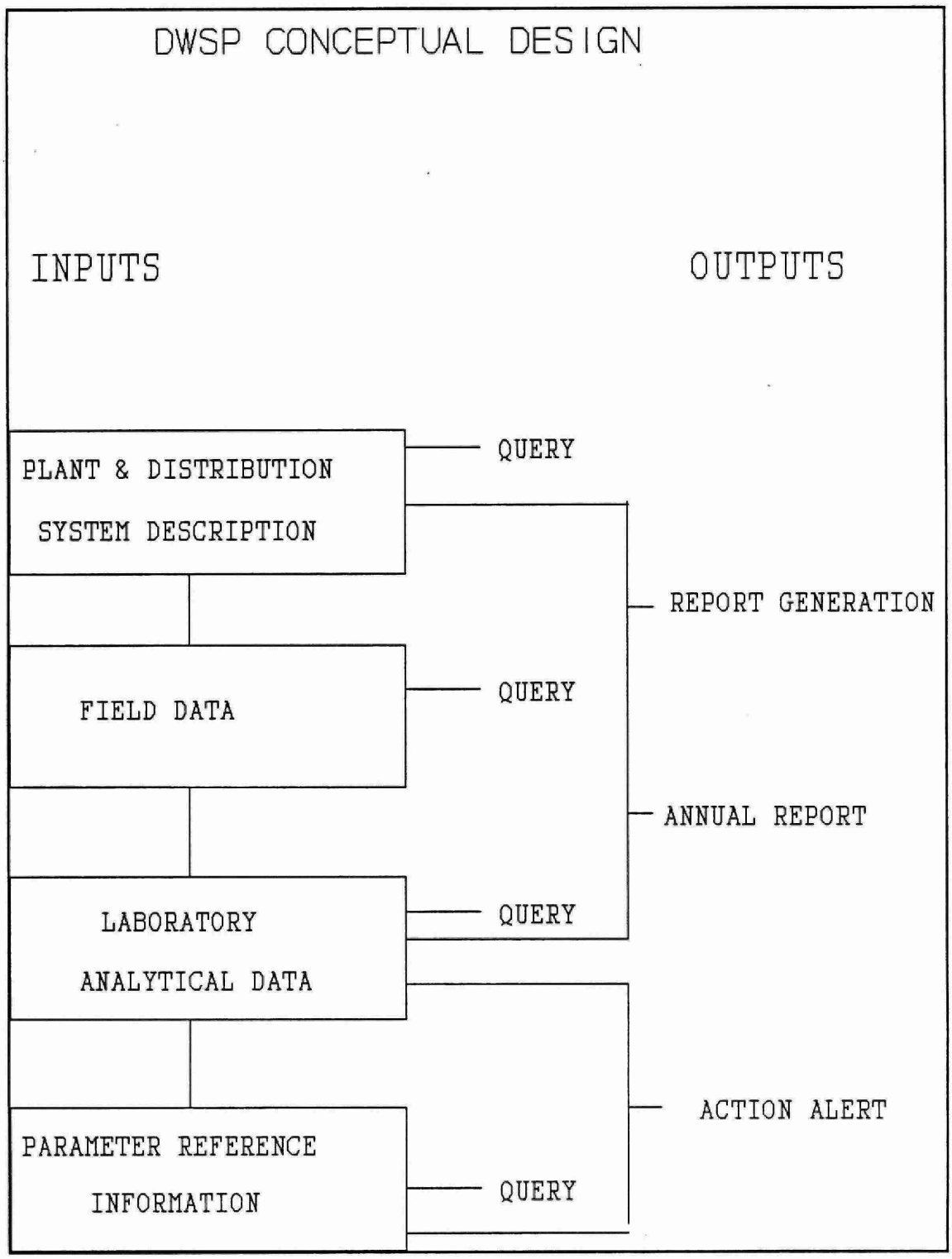

DWSP CONCEPTUAL DESIGN
INPUTS
OUTPUTS
PLANT & DISTRIBUTION SYSTEM DESCRIPTION
FIELD DATA
LABORATORY ANALYTICAL DATA
PARAMETER REFERENCE INFORMATION
QUERY
QUERY
QUERY
QUERY
REPORT GENERATION
ANNUAL REPORT
ACTION ALERT

FIG.2

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

(B2001P) PARAMETER
REFERENCE
BENZENE

SOURCE	FROM	TO	METHOD	TARG	UNIT	NOTE
EPA C	86/04		NOMETH	.00	063000 UG/L	RMCL
EPAA C	80/11		NOMETH	6.60	063000 UG/L	
FERC C	84/05		NOMETH	1.00	063000 UG/L	
WHO C	84/01		NOMETH	10.00	064000 UG/L	

DESCRIPTION: NAME: BENZENE
CAS#: 71432
MOLECULAR FORMULAE: C_6H_6
DETECTION LIMIT: (FOR METHOD POCODO) 0.05 UG/L
SYNONYMS: BENZOLE, COAL NAPHTHA, CARBON OIL (27), CYCLOHEXATRIENE (41)
CHARACTERISTICS: COLOURLESS TO LIGHT YELLOW, MOBILE, NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC, VAPOURS BURN WITH SMOKING FLAME (30)
PROPERTIES:
SOLUBILITY IN WATER: 1780-1800 MG/L AT 25 DEG C (41)
THRESHOLD ODOUR: NO DATA
THRESHOLD TASTE: 0.5 MG/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMUALTE IN LIVING ORGANISMS, APPEARS TO BIOACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT HIGH LIPID CONTENT OR ARE MAJOR METABOLIC SITES (LIVER, BRAIN), SMALL QUANITIES EVAPORATE FROM SOIL OR DEGRADE QUICKLY
SOURCES: PETROLEUM REFINING, SOLVENT RECOVERY, COAL TAR DISTILLATION, FOOD PROCESSING, TANNING.
USES: PREPERATION OF ETHYL BENZENE USED AS A STYRENE MONOMER, DETERGENTS, NYLON, AS INTERMEDIATE IN PESTICIDE PRODUCTION, SOLVENT IN RUBBER INDUSTRY, DEGREASING AND CLEANSING AGENT, GASOLINE.
TOXICITY: RATING 4 (VERY TOXIC); ACUTE - IRRITATES MUCOUS MEMBRANES, SYMPTONS INCLUDE RESTLESSNESS, CONVULSIONS, DEPRESSION, RESPIRATORY FAILURE; CHRONIC - ANEMIA AND LEUKEMIA (45).
CARINOGENICITY: HUMAN CARCINOGEN AND MUTAGEN
REMOVAL: GAC ADSORPTION, PRECIPITATION WITH ALUM FOLLOWED BY SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION (41).
MOLECULAR WEIGHT: 78.12 GRAMS
MELTING POINT: 5.5 DEGREES C (27)
BOILING POINT: 80.1 DEGREES C (27)
SPECIFIC GRAVITY: 0.879 AT 20 DEGREES C (27)
VAPOUR PRESSURE: 100 MM AT 26.1 DEGREES C
HENRY'S LAW CONSTANT: 0.00555 ATM M_3/MOLE
LOG OCT./WATER PAR.COEFF: K=1.0 1/N=1.6 R=.97 PH=5.3

Appendix B

DWSP SAMPLING GUIDELINE

i) RAW and TREATED at PLANT

General Chemistry	-500 mL clear plastic bottle -rinse bottle with sample three times and discard water -fill to line
Bacti	-250 mL clear glass bottle with white seal on cap -do <u>not</u> rinse bottle; preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (**Caution:** HNO_3 is corrosive)
Volatiles (OPOPUP)	-250 mL clear glass bottle -do <u>not</u> rinse bottle -tilt bottle when filling -fill bottle completely; there should be no air bubbles.
Organic (OWOC),(OWTRI),(OAPAHX)	-1 liter brown glass bottle per scan -do <u>not</u> rinse bottle -fill to approx. 1" from top -when 'special pesticides' are requested three extra bottles per sample must be submitted
Cyanide	-500 mL clear plastic bottle -do <u>not</u> rinse bottle -fill to approx. 1" from top -add 10 drops sodium hydroxide (**Caution:** NaOH is corrosive)

Mercury	-250 mL clear glass bottle -rinse bottle and cap three times, discard then fill to top of label -add 20 drops each nitric acid and potassium dichromate (**Caution:** HNO_3 and $KCrO_7$ corrosive)
Phenols	-250 mL clear glass bottle -do <u>not</u> rinse bottle -fill to top of label as marked

<u>Steps</u>

1. Let cold water tap run for several minutes.
2. Record time in submission sheet.
3. Record teperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL clear palstic bottle -rinse bottle with sample three times and discard -fill to line
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (**Caution:** HNO_3 is corrosive)

Steps:

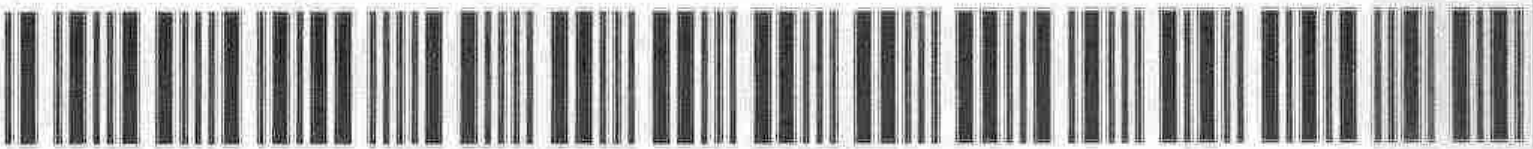
1. Record time on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL clear plastic bottle -rinse bottle with sample three times and discard water -fill to line
Bacti	-250 mL clear glass bottle with white seal on cap -do <u>not</u> rinse bottle; preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (**Caution:** HNO_3 is corrosive)
Volatiles (OPOPUP)	-250 mL clear glass bottle -do <u>not</u> rinse bottle; preservative has been added -tilt bottle when filling -fill bottle completely; there should be no air bubbles
Organic (OWOC), (OWTRI)	-1 liter brown glass bottle per scan -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top
Cyanide	-500 mL clear plastic bottle -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top -add 10 drops sodium hydroxide (**Caution:** NaOH is corrosive)
Mercury	-250 mL clear glass bottle -rinse bottle and cap three times, discard then fill to top of label -add 20 drops each nitric acid and potassium dichromate (**Caution:** HNO_3 and KCrO7 corrosive)

Steps:

1. Record time on submission sheet.
2. Let cold water flow for ten minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), tubidity and pH on submission sheet.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